—THE—

Therapeutic Gazette.

Whole Series, Vol. XIV. | DETROIT, MICH., PHILADELPHIA, PA., | February 15, 1890. | Third Series, Vol. VI. No. 2.

CONTENTS.

Original Communications.

PAGE

The Action of Alcohol on Animal Heat Functions. By Edward T. Reichert, M.D. ... 73
Hydrastinine in Uterine Hemorrhage. By Edmund Falk, M.D. ... 86
Gastric Ulcer, with Fibroid Enlargement and Induration of the Pylorus, or Cancer (?). By Chas. M. Mutz, M.D. ... 91
Rhus Toxicodendron. By Chas. Raymond Carpenter, M.D. ... 93

Leading Articles.

Cocillafia as an Expectorant ... 96
The Hypnotic Action of Chloralamide ... 97
The Diuretic Action of Theobromine ... 99
Euphrasia Officinalis and the Treatment of Coryza ... 100
On Scopolia Carniolica—A New Source of Hyoscyamine ... 101

Reports on Therapeutic Progress.

Diagnosis of Ovarian Tumors from Uterine Fibroids ... 95
The New Hypnotics ... 102
Influenza Therapeutics ... 106
Picric Acid in the Treatment of Skin-Diseases ... 107
Value of Salicylate of Sodium in Dysmenorrhœa ... 107
A New Antiseptic Dressing ... 108
The Use of Oxygen in the Treatment of Leuchæmia and Grave Anæmias ... 108

PAGE

The Action of Astringents ... 111
Disinfection of Dwellings by Means of Sulphur Dioxide ... 111
Abrus Precatoria ... 113
Hydronaphthol as a Specific in the Treatment of Tinea Tonsurans ... 114
The Local Action of Helleborein ... 114
The Influence of Opium and Morphine on Uric Acid considered with Reference to their Action in Health and Disease ... 115
Treatment of Scarlatinal Nephritis ... 115
The Administration of Certain Drugs by Electricity ... 116
Thiol and Ichthiol ... 117
Menthol in Acute Rhinitis, Influenza, and other Affections of the Nose and Throat ... 117
Cactus Grandiflorus in some Forms of Heart-Disease ... 118
The Action of Lobeline ... 118
Use of Atropine as an Antagonist to Chloroform ... 119
Comparative Action of the Natural and Artificial Salicylic Acids and their Salts of Sodium ... 119
The Treatment of Pharangeal Inflammations by the Internal Administration of Salol ... 120
The Antifermentative Treatment of Infantile Diarrhœa ... 121
Eseridin ... 121
A New Theory of Diabetes ... 122
Pereirine as an Adjuvant to Quinine in Malaria ... 122
The Antisepsis of the Renal Passages by the Internal Use of Salol ... 123
Phenyl Urethan ... 123
The Administration of Preparations of Iodine and Bromine through the Rectum ... 123

PAGE

Yellow Oxide of Mercury Subcutaneously administered ... 124
Treatment of Medical Emergencies ... 124
The Injection Treatment of Acute Gonorrhœa ... 127
Pathology of Duodenitis after Burns ... 128
The Antiseptic Properties of Lime ... 129
Papain in Ear-Diseases ... 129
Tracheal Injections in Pneumonia ... 130
Alum Enemata in Dysentery ... 130
Chloride of Sodium in Facial Neuralgia ... 131
Saccharin in Cystitis ... 131

Reviews ... 132

Correspondence.

Paris Letter ... 135

Notes and Queries.

Incompatibility in Prescriptions ... 137
The Treatment of Influenza ... 139
The Administration of Chloral ... 139
The Effect of Distention of the Abdomen on Circulation and Respiration ... 140
Essence of Winter-Green ... 141
Ammonia in Cocaine-Poisoning ... 141
A New Contribution to the Study of Pneumonia ... 141
Naphthalin and Cataract ... 142
Floods and their Results from a Sanitary Stand-Point ... 143
Standards for Milk Analysis ... 143
The Tenth International Medical Congress ... 143
A New Operation for Displacement of the Uterus ... 143
The Ophthalmic Review ... 144

Original Communications.

THE ACTION OF ALCOHOL ON ANIMAL HEAT FUNCTIONS.

By Edward T. Reichert, M.D.*

THE important position occupied by alcohol in the domain of therapeutics demands an accurate and thorough knowledge of its physiological actions, yet the evidence accumulated through various channels of research or observation is so conflicting that but few of its characteristic properties are definitely and fully known. Doubtless much of this contradictory testimony is attributable to the diverse circumstances under which the studies were made, to imperfect methods, faulty observation and deduction, and, among other probable conditions, a more or less complex action in the production of a given effect, in which several factors may be involved which vary in their relative importance in different cases and thus give rise to results which may even be opposite. Apart from our knowledge of the action of alcohol on bodily temperature its influence on the heat functions is extremely unsatisfactory. The asserted value of this agent as a food, its unquestionable efficacy in febrile and adynamic conditions, its peculiar molecular composition and tendency to undergo oxidation and

* Professor of Physiology, University of Pennsylvania.

yield energy in the form of heat render it of peculiar interest in this respect and suggest the value of accurate information of its effects on the economy.

The study of the action of any agent on thermal processes involves the consideration of its effects on the quantity of heat produced, the quantity dissipated, and on the bodily temperature. Investigators have been led to determine heat production by *indirect* or *direct* calorimetry. Indirectly, it is estimated through a knowledge of the quantities and chemical composition of the substances entering the body as food, and of the effete principles resulting from their oxidation, and from this data computing the amount of heat evolved; or, by regarding temperature changes in the organism as indicating similar alterations in thermogenesis. Directly, the heat formed is measured by means of an instrument specially adapted for direct determination, and hence known as the calorimeter. Practically, all the work done with alcohol has been accomplished by the indirect method, and is accordingly open to many sources of error and is inconclusive. For while there can be no doubt that CO_2, urea, phosphates, and other effete matters arise through destructive tissue metamorphosis, by which heat is formed as the chief result, just what importance any or all of these products possess in indicating the degree, or even the direction, of the activity of the processes concerned in heat production is far from being determined. Desplatz's experiments on rats, guinea-pigs, and small birds, and Senator's on dogs, in which the heat formed was measured by a calorimeter, and the CO_2 by established methods, would lead us to believe that there exists no direct relation between the quantity of heat formed and of CO_2 eliminated; while in connection with urea, which was once looked upon as almost an absolute index of tissue waste, recent experiments show quite clearly that the quantity eliminated is indicative of the amount of nitrogenous food and not of retrograde metamorphosis. Finally, that there is no definite relation between bodily temperature and heat production is clearly evident whenever the two are measured simultaneously for consecutive hours. Until, however, the precise values which these effete matters possess in indicating the nature of the changes in thermogenesis are definitely established, their usefulness in suggesting the probable direction of thermal alterations may be accepted with caution and reserve.

The present experimental opinions of the actions of alcohol on the heat functions being founded on the CO_2, and urea and other salts eliminated, and upon alterations in bodily temperature, we may consider these for convenience and clearness *seriatim*.

Since the chemical processes in the body are essentially those of oxidation, and as the heat evolved is almost wholly due directly or indirectly to such changes, the measure of the amount of oxygen consumed is equally, if not, indeed, more important than that of CO_2 given off. Under normal conditions more oxygen is consumed than represented in the CO_2 eliminated, the relation between them $\frac{CO_2}{O} = .906$, being the "respiratory quotient." The excess of oxygen goes to form other oxidative products, and as the respiratory quotient is subject under certain conditions to marked changes, it is clear that the quantity of CO_2 formed may be far from indicating the quantity of oxygen consumed, and, as a consequence, if considered alone, may give rise to obvious sources of error. The older observers did not realize the importance of measuring the oxygen in connection with their CO_2 estimations, consequently Prout, Vierordt, Böcker, Bernard, Hammond, Smith, Berg, Davis, and others studied only the CO_2 eliminated, and even these calculations are generally, because of various other defects in the method of experiment, of but little intrinsic value. Of the recent investigations, some have taken account only of the O consumed, others of both the O consumed and CO_2 eliminated. Thus, Rumpf asserts, without sufficient grounds, however, that in guinea-pigs in alcohol narcosis the quantity of oxygen consumed is diminished. Henrijean, in experiments on himself, noted an increase. Boeck and Bauer, in a few and unsatisfactory experiments on dogs and cats, found that small doses diminished both the consumption of O and elimination of CO_2, while larger doses, not sufficient to cause narcotism, notably increased both quantities. Experiments on rabbits by Wolfers show that when animals are placed in a bath of constant temperature, O and CO_2 were increased and the respiratory quotient generally lowered. Bodländer, in two dogs, found the consumption of O reduced 11.72 and 19.10 per cent. respectively, and the elimination of CO_2 reduced 10.78 and 19.16 per cent. In a rabbit the alterations were respectively 3.13 and 7.74 per cent., the respiratory quotient not being especially affected. Zuntz and

Berdez, in observations on man, using doses of 20 to 30 c.c., and maintaining complete muscular quiet, noted an increase in both O and CO_2 of 3.5 per cent. Other experiments made by Geppert led him to assert that alcohol, in moderate quantities, had no decided effect on the amount of oxygen consumed, while the quantity of CO_2 eliminated was unaffected or slightly diminished. It will be observed that the evidence regarding the consumption of O and elimination of CO_2 is conflicting. The most carefully performed experiments indicate a diminution of both, but this cannot be considered definitely settled.

The results of observations in connection with the elimination of urea and certain other effete matters found in the urine and fæces are, on the other hand, quite uniform. Thus, Böcker, Fokker, Hammond, Parkes and Wollowicz, Munk, Riess, and Desplatz all affirm that the quantity of urea is diminished, although most of the work is all but valueless, owing to the neglect of the determination of the precise amount of nitrogenous matter entering the body as food, as well as the quantity of water drunk, or because of the periods of experiments being too brief, or for other reasons.

Studies of the action of alcohol on bodily temperature, of both man and animals, under normal and abnormal conditions, are numerous and the results contradictory. The feeling of warmth in the stomach, and afterwards in the skin, after the ingestion of this agent, naturally suggest that it increases temperature, and while we are not without evidence to show that such, under certain circumstances, may be the case, there can be no question, however, that the characteristic action is to produce a distinct diminution. Differences in the results are largely due to variations in the quantity of alcohol taken and upon the attendant circumstances of method or otherwise. But few observers have noted a distinct rise. Lallemand, Perrin, and Duroy state that large doses always cause a primary increase, followed by a diminution. Lichtenfels and Fröhlich, in two experiments on man,—one with four ounces of eight per cent. alcohol and the other with two ounces of seventeen per cent.,—found a primary increase in the former of .5° and in the latter of .32°. In the first, the temperature returned to the normal in forty-five minutes, and in the latter in fifty minutes. Riegel states, as a result of a careful series of experiments, that only exceptionally is an elevation of temperature observed. Riegel's results I have confirmed by twenty-two experiments on dogs, each covering an average of several hours, with doses varying from 1.25 c.c. to 5 c.c. of alcohol per kilo of body weight. In only five did the temperature at any time go above the normal, then only from .1° to .5° C., commonly but .2° or .3°, and generally immediately after the dose. The action of alcohol on temperature in the opposite direction is far better marked and very constant. Tscheschichin, in experiments on rabbits, always noticed a fall. Lallemand and others, in dogs, found a fall following the primary rise. Bouvier, states that in experiments on different animals, small doses diminish temperature not attended by any increase; larger doses diminish to a greater degree; in fever, a similar diminution occurs. Binz, Daub, Parkes and Wollowicz, Ringer and Rickards, Riegel, and others have all noted a diminution more or less marked or even profound; occasionally, however, as in certain of Parkes and Wollowicz's observations, no appreciable change occurred even after doses of from 10 to 20 ounces of claret in man, or from 1 to 6 ounces of brandy.

The careful studies of Riegel, embracing eighty-six experiments on man, lead to conclusions which doubtless closely represent the peculiar actions of alcohol on animal temperature. In his summary he states, among other conclusions, that—1, alcohol, even in moderate doses, in many cases causes a lowering of the temperature, the amount of diminution averaging, as a rule, a few tenths of a degree C.; 2, only exceptionally is an elevation of temperature detected, and not unfrequently after small doses there is no noticeable change; 3, the frequent repetition of doses of alcohol diminishes the lowering effect; 4, the amount of diminution is directly proportional to the dose; 5, the depression for the most part is of short duration. My own experiments on dogs agree in their results with the conclusions of Riegel. The intensity of the action, however, is far from always being in accord with the dose, a given dose in one case producing a profound effect, and in another little or almost none. Illustrations of this may be seen in records of experiments in this paper.

Briefly, the evidence, then, seems to indicate that the quantity of oxygen consumed and CO_2 and other effete matters given off are diminished and the bodily temperature lowered. All these changes being in harmo-

nious relation strongly suggest that alcohol diminishes the normal activity of tissue changes. This finds support in the experiments of Nencki and Sieber, and Simanowsky and Shoumoff, in their studies on the influence of this drug on the oxidation of certain substances injected into the organism when they found the change diminished.

The fact that CO_2 is not increased is one of great practical economic importance, for it must be evident that either this gas does not constitute one of the chief products resulting from the decomposition of alcohol, or else general tissue metamorphosis is so diminished that the quantity of CO_2 eliminated largely represents an alcohol derivative.

That this agent rapidly undergoes chemical change after absorption, that but a small percentage is eliminated as such, and that we do not find either in the system or excreta any immediate oxidation products, is clearly established. What becomes of it and in what form eliminated are unsettled problems. The experiments of Schulinus and Salzynski show that living blood causes about ten per cent. to disappear immediately. The work of Anstie also demonstrates that this substance undergoes rapid alteration. Thus, to a small dog was given an ounce of brandy daily for eleven successive days. On the last day, after receiving the dose, he was killed, quickly chopped up, and the minced tissues extracted for alcohol. But only one-fourth of the drug represented in the last dose of brandy was recovered, while the total quantity eliminated the day before was only 1.13 grains. Dupré noted that but a small percentage of the alcohol taken was excreted as such, this being supported by the earlier and less valuable investigations of Lallemand, Perrin, and Duroy. Parkes and Wollowicz found that practically none was eliminated after twenty-four hours, and Anstie observed that after the ingestion of three or four ounces of alcohol only one or two grains could be found in the urine. Heubach, in experiments on individuals with fever, to which were given doses of from 18 c.c. to 325 c.c., determined, as a result of twenty-two experiments, an elimination in the urine of 1.12 per cent.

That the skin and lungs are not more important than the kidneys in this elimination is evident from the recent work of Bodländer on himself and a dog. On himself, after taking from 50 c.c. to 100 c.c. of absolute alcohol, diluted with from twenty to fifty per cent. of water, the quantity recovered in the urine varied from .17 to 1.86 per cent., or an average of 1.18 per cent. The maximum was recovered during the first hour, a small quantity during the second, and the merest traces during the third. In the dog, after doses of from 20 c.c. to 30 c.c. of absolute alcohol, 1.57 per cent. was recovered in the urine. Through the skin he recovered from himself .14 per cent., and through his lungs 1.6 per cent.; through the dog's lungs 1.95 per cent., but none from the fæces and intestines. The total amount recovered from himself was 2.92 per cent., and from the dog 3.52 per cent. Larger quantities have been recovered by other investigators, as, for instance, by Subbotin in experiments on rabbits in which excessive doses were used, the quantity in such observations amounting to about sixteen per cent. It seems very clear from this work that alcohol, in moderate quantity, rapidly undergoes alteration in the system and that but a small percentage is eliminated as such.

While we do not know the precise nature of this change, there is no reason to believe that a more complex molecule is formed; but, on the other hand, the indication is of a breaking up of the molecule into simpler bodies, such as CO_2 and H_2O. As it is obviously impossible to satisfactorily detect in the excretions such small quantities of H_2O as would thus be formed, we are dependent alone on estimations of CO_2. Here we meet with the formidable indication that the quantity of CO_2 eliminated after alcohol is actually less than normal. This, however, is explicable in the possibility of the drug acting directly upon the heat processes and lessening normal tissue metamorphosis, thus diminishing the amount of the gas arising in this way, and supplying a portion of the deficiency from its own decomposition. That it does diminish destructive tissue change seems supported by the lessening of the amount of nitrogenous and other effete matters, and also by the diminution of the animal's temperature. But this can only satisfactorily be determined by direct measurement of the quantity of heat produced and dissipated.

Alcohol, as is well known, yields an enormous amount of energy in the form of heat during its complete oxidation, one gramme of absolute alcohol setting free nine kilogramme degrees. Should the alcohol thus be oxidized in the body, the heat evolved from a quantity, such as taken by Bodländer (100 c.c.), would equal about seven hundred and fifteen kilogramme degrees, being equivalent to about one-fourth the total approximate heat production of an average man per

diem. The amount of CO_2 formed would be equal to about one hundred and fifty-two grammes, or one-sixth the mean quantity eliminated per diem. That this agent actually does yield energy, or else conserve the tissues, or both, is also evident in its power of sustaining the system in disease, in the increase of body weight often observed in drunkards even on restricted diet, and the known ability of the economy to maintain an equilibrium of metabolism on limited food. Should alcohol thus yield energy it is obvious that the total output of heat must be increased or less tissue change occur to compensate for it. Calorimetrical experiments alone can determine this, and the only observations of the kind recorded are those of Bevan Lewis (*Journal of Mental Science*, 1880–81, p. 20), Wood and Reichert (*Journal of Physiology*, iii. p. 321), and Desplatz (*Maly's Jahresberichte ü. d. Fortschritte der Thierchemie*, 1886, s. 365). The experiments of Bevan Lewis were performed on rabbits with a calorimeter such as described by Burdon-Sanderson but somewhat modified. The observations were made during quarter-hour intervals and commonly for six consecutive periods. From a number of experiments, only a few of which are given, he reaches the following conclusions:

1. A primary check to heat formation is most marked and protracted when small doses of alcohol are given.

2. A pronounced fall of body temperature is most marked during the first quarter hour and coincident with the primary *check* to thermogenesis.

3. A secondary greatly increased heat production varies directly with the dose.

4. The increased heat production is manifested over a more prolonged period after larger doses.

5. The increase of heat production is gradually augmented from time to time until the heat climax is reached, a period usually coincident with the registry of the *lowest* bodily temperature.

6. The heat climax is more protracted or postponed and is greater in degree with larger doses of alcohol.

7. The greatest loss of heat units from temperature (diminution of temperature) occurs during the first interval, subsequent intervals being marked by a still progressive loss, which, however, becomes less towards the period of heat climax, when a restitution to the normal of temperature begins.

8. With small doses of alcohol this restitution of bodily temperature is usually sudden or comparatively rapid in operation; after larger doses the return to normal temperature is spread out over a longer period, being extremely tardy when very large doses are administered.

9. The characteristic action of alcohol is that of greatly increasing the heat production, while a dispersion of fresh formed heat is facilitated by peripheral vaso-motor paresis, and that only in very small doses we get a temporary lowering of the heat functions.

In the experiments of Wood and myself on dogs five observations were made with different doses, and with results in accord generally with Bevan Lewis's, inasmuch as on the whole heat production and dissipation were both increased. Our experiments were conducted differently, the normal production and dissipation being studied for one period of from one to two and a half hours, then the alcohol given, and a second observation made for a similar length of time. These results are here tabulated:

No. of experiment.	Duration (hours).	Weight of animal (pounds).	Dose (grains).	Hourly dissipation of heat.				Hourly production of heat.			
				Normal.	After drug.	Increase.	Per cent. increase.	Normal.	After drug.	Increase.	Per cent. increase.
1	2½	14.75	♏l (3.3)*	80.6414	88.0207	7.3793	9 1	78.7509	87.0251	8.2742	10.5
2	1½	13	♏ii (70)†	101.9647	146.1720	44.2073	33.5	77.9220	101.9647	24.0427	30.8
3	1½	22	♏iiss (60)‡	155.8239	174.8450	19.0211	12.2	133.2650	155.2859	22.0209	16.5
4	2	22	ℨi (22)§	138.4432	182 0656	43.6224	31.5	138.4432	173.5816	37.1384	26.8
5	1	18 (?)	ℨss (27)‖	88.26	89.6321	1.3721	1.5	72.1361	96.03	23 8939	31.4
						Average =	17.6			Average =	23.2

* Dose in parenthesis in grains per pound of body-weight.
† By the stomach (eighty per cent. alcohol).
‡ By the stomach, ℨi; subcutaneously, ℨiss (ninety per cent. alcohol).
§ By the stomach (eighty per cent. alcohol).
‖ Hypodermically (ninety-five per cent. alcohol).

Desplatz made four half-hourly experiments on rats, and in each found a diminution in heat dissipation and of CO_2 and nitrogen eliminated.

In Lewis's experiments a check to heat formation was detected during the first quarter hour; following this the increase was decided. Thus, after moderate doses, in an animal in which the normal production per kilo was .95 gramme-units, during the first interval after alcohol it was .46 gramme-units, during the second 2.7, the third 1.3, and the fourth 1.5 units, the increase after the first interval being nearly threefold. The mean heat production following alcohol was more than normal,—viz., equal to 1.49 units. Our own experiments cover hours; hence we obtain mean figures for the periods during which Lewis made observations for short intervals. Therefore, if a primary check commonly occur, it is lost in the relatively larger heat production following. As a consequence, the mean in our experiments always shows an increase. Lewis always noted a diminution of temperature, dependent, of course, upon the excess of dissipation over production. In our experiments similar results were obtained in two, while in the other three production was in excess, with a consequent rise of bodily temperature. The doses varied within wide limits, but no relation is evident between these differences and the varying results. In Lewis's experiments the temperature curve diminished from the first, showing that heat dissipation was always in excess of heat production. Curiously, the greatest depression of temperature occurred coincidently with the greatest heat production. The results of the experiments of Bevan Lewis, and Wood and myself on heat production are contradicted by those of Desplatz and the evidence indicating a diminution in the amount of tissue metamorphosis.

Whether a drug affects primarily the process of dissipation or that of production must perhaps always remain a matter of speculation. It seems fair to infer that when heat production is changed more than dissipation, in either direction, whether increased or decreased to a greater extent, the former would be the part of the mechanism primarily affected, and that the alteration occurring in the latter would be in the way of compensation to prevent undue increase or diminution of the animal's temperature. With alcohol Lewis always found an excess of dissipation, while in only two of our five experiments was this noted. The indication here would be that the function of dissipation is the one primarily affected, and that the increase of production was to make up for this excessive loss. This is certainly not without support in the belief that this agent causes peripheral vaso-motor dilatation, and thus facilitates the loss of heat. The increase of thermogenesis, on the other hand, is certainly not in accord with what we would be led to expect from studies made in the elimination of CO_2, urea, etc. Apart from this inconsistency, there are ample reasons why, in the premises, both the experiments of Lewis, Wood and myself, and Desplatz are of questionable value. Our own experiments are certainly too few and inconclusive, while those of Lewis lose much of their weight in the fact that the accurate working of his instrument is open to suspicion, for during some intervals absolutely no heat was shown by the calorimeter, although, as is obvious, the animal must have radiated an appreciable quantity. In Desplatz's experiments the heat dissipation only was recorded.

Thus the absence of accurate and satisfactory knowledge of the actions of alcohol on the animal heat functions, of the successive phases of its influence during consecutive hours, together with the value of such data to the therapeutist and dietician, prompted the present inquiry. These experiments were performed by the aid of a new and improved calorimeter (*University Medical Magazine*, January, 1890), which, by rigid testing, was proven an instrument of precision. Dogs were always used. During the first hour the animals were studied without any drug and the result taken to represent a normal standard, although an uncertain one, since the heat processes are subject to considerable variation from hour to hour. Following this normal hour the alcohol was given and the animal subjected to study for from five to six consecutive hours. Since the normal standard thus obtained is of doubtful value as an accurate mean of heat production, it is sometimes too low or too high. Such errors are eliminated by a frequent repetition of the experiments.

Three series of experiments were made. In one commercial alcohol (sp. gr. .835) was given by the stomach, and in a second hypodermically. In the third series absolute alcohol was used to eliminate effects which might possibly be dependent upon foreign substances, like fusel oil, in the former. The doses employed were always in direct relation to the body weight, being in proportion

of 1.25 c.c., 2.5 c.c., and 5 c.c. per kilo. Such quantities seem large because representing enormous doses in man, yet they are never toxic in the dog. It is rare after doses of even 2.5 c.c. per kilo that any marked evidences of intoxication are present. If so, the maximum effect is manifest during the first and second hours. After doses of 5 c.c. per kilo, alcoholism is decided. The phenomena are usually marked during the first hour, then commonly increased a little, and gradually fade away noticeably during the progress of the experiment, but at times they grow more and more pronounced. This dose is, however, far from being a fatal one, which is perhaps about 8 or 10 c.c. per kilo of absolute alcohol. With the largest doses vomiting sometimes occurs, and when hypodermically injected local abscesses commonly followed.

The prominent features in these records are the fluctuations in heat production and heat dissipation occurring from hour to hour, the general tendency to a diminution of heat production and relative excess of heat dissipation, and the generally downward and progressive fall of the animal's temperature. While the variations from hour to hour in production and dissipation are quite noticeable, they are, as a whole, no greater than is common in normal animals. The peculiar actions of the drug are, therefore, manifest in the prevailing direction of the changes in these functions and their relation to each other, by which the bodily temperature becomes altered. For the convenience and facility of study, the main incidents in the records of the different series will be considered *seriatim*, examining first the first and second series, in which commercial alcohol was used, then the third series, with absolute alcohol.

In the first series commercial alcohol was given by the stomach, diluted with from three to four parts of water, and warmed to about the temperature of the body. In Experiment 1 the dose was 1.25 c.c. per kilo. The quantity of heat produced was above the normal standard during the entire experiment, the most marked increase being observed during the first hour. Heat dissipation, on the other hand, was below the standard throughout the experiment, with the result of increasing the animal's temperature. In Experiments 2, 3, 4, and 5 the dose was double, or 2.5 c.c. per kilo. In Experiment 2 heat production during the first hour was increased, and even to a greater extent during the second hour; a fall then occurred, reaching the normal, followed by a further diminution, and this by a rise. The mean quantity of heat produced per hour during the experiment was greater than normal. Heat dissipation was less than normal, excepting during the first hour, but, as a whole, in excess of heat production; hence the animal's temperature was always subnormal. In Experiment 3 both heat production and dissipation were, on the whole, increased, and were always above the normal, save heat production during the first and last hours, when it was a little less. Dissipation was, on an average, greater than production, and the animal's temperature was lowered. In Experiment 4 both heat production and dissipation were decidedly diminished; the former was, however, in excess, excepting during the first and last hours, when the same. The temperature was always normal or above it. In Experiment 5, in which the dose was 5 c.c. per kilo, production was always less than normal, also dissipation, excepting during the first hour, when but a trifle above. Dissipation generally was in excess of production, and, as a result, temperature was reduced. In Experiment 6, with a similar dose, production was notably decreased during the first hour, went above normal during the second, and declined to far below normal during the subsequent periods. Dissipation was always subnormal, except during the first hour, and, with the exception of the second and fifth hour, in excess, and, as an average, greater, so that a distinct reduction of bodily temperature occurred.

In the second series similar doses were given, but administered hypodermically. In such experiments we would naturally expect a more prompt and energetic action, and perhaps some slight modifications in the general characters of the curves, owing to the more rapid absorption into the blood, and perhaps to the absence of direct effects of alcohol on the peripheries of the pneumogastric nerves when given by the former method. The curves, as a rule, certainly do not exhibit such decided fluctuations, while the relations between the processes of production and dissipation are appreciably more constant, the result being a diminution of temperature in all experiments during the entire observation, excepting during the third hour in Experiment 7 and the first hour in Experiment 10, when it was normal, and the fourth, fifth, and sixth hours in Experiment 7, when it went some tenths above.

FIRST SERIES.—*Commercial Alcohol, Sp. Gr. .835, by the Stomach.*

Experiment 1.—Dog; weight, 10.65 kilos; dose, 1.25 c.c. per kilo.

	Hourly heat production.	Hourly heat dissipation.	Rectal temperature.			Average room temperature during hour.
			Beginning of hour.	Ending of hour.	Gain or loss (+ or —).	
Before alcohol	19.017	25.833	38.9°	38.1°	—.8°	15.90°
First hour after alcohol	25.852	25.000	38.1°	38.2°	+.1°	16.25°
Second hour after alcohol	21.685	20.833	38.2°	38.3°	+.1°	17.15°
Third hour after alcohol	22.916	22 916	38.3°	38.3°	±.0°	17.65°
Fourth hour after alcohol	23.768	22.916	38.3°	38.4°	+.1°	18.70°
Fifth hour after alcohol	23.750	23.750	38.4°	38.4°	±.0°	19.30°
Sixth hour after alcohol	22.234	21.382	38.4°	38.5°	+.1°	17.90°

Experiment 2.—Dog; weight, 6.75 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	13.056	17.916	39.9°	39.0°	—.9°	17.10°
First hour after alcohol	14.430	18.750	39.0°	38.2°	—.8°	17.10°
Second hour after alcohol	20.200	17.500	38.2°	38.7°	+.5°	17.40°
Third hour after alcohol	12.963	14.583	38.7°	38.4°	—.3°	17.55°
Fourth hour after alcohol	16.654	15.546	38.4°	38.6°	+.2°	17.80°
Fifth hour after alcohol	12.376	12.916	38.6°	38.5°	—.1°	18.05°
Sixth hour after alcohol	13.873	13.333	38.5°	38.6°	+.1°	18.20°

Experiment 3.—Dog; weight, 10 7 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	19.768	19.250	38 10°	38.15°	+.05°	16.85°
First hour after alcohol	17.083	20.916	38.15°	37.70°	—.45°	18.20°
Second hour after alcohol	23.810	24.666	37.70°	37.60°	—.10°	18.15°
Third hour after alcohol	26.852	23.000	37.60°	38.05°	+.45°	18.25°
Fourth hour after alcohol	19.222	20.500	38.05°	37.90°	—.15°	18.20°
Fifth hour after alcohol	23.022	22.166	37.90°	38.00°	+.10°	18.80°
Sixth hour after alcohol	18.810	19.666	38.00°	37.90°	—.10°	18.40°

Experiment 4.—Dog; weight, 10 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	36.983	34.583	38.25°	38.55°	+.30°	20.10°
First hour after alcohol	33.333	33.333	38.55°	38.55°	±.00°	20.00°
Second hour after alcohol	30.080	30.000	38.55°	38.56°	+.01°	19.80°
Third hour after alcohol	24.210	23.750	38.56°	38.63°	+.07°	19.70°
Fourth hour after alcohol	30.300	27.500	38.63°	38.98°	+.35°	19.80°
Fifth hour after alcohol	21.393	20.833	38.98°	39.05°	+.07°	20.00°
Sixth hour after alcohol	20.833	20.833	39.05°	39.05°	±.00°	19.80°

Experiment 5.—Dog; weight, 7.03 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	16.104	16.666	38.35°	38.25°	—.10°	20 78°
First hour after alcohol	13.395	17.500	38.25°	37.52°	—.73°	20.65°
Second hour after alcohol	13.856	16.666	37.52°	37.02°	—.50°	21.00°
Third hour after alcohol	14.073	12.500	37 02°	37.30°	+.28°	21.10°
Fourth hour after alcohol	12.738	13 750	37.30°	37 12°	—.18°	20.70°
Fifth hour after alcohol	11.709	10.416	37.12°	37.35°	+.23°	20.85°
Sixth hour after alcohol	13.512	12.500	37.35°	37.53°	—.18°	21.10°

Experiment 6.—Dog; weight, 7.25 kilos; dose, 5 c.c. per kilo.

Before alcohol	25.090	26.250	39.60°	39.40°	—.20°	20.10°
First hour after alcohol	19.543	27.083	39.40°	38.10°	—.30°	19.90°
Second hour after alcohol	26.486	24.166	38.10°	38 50°	+.40°	19.75°
Third hour after alcohol	19.020	22.500	38.50°	37.90°	—.60°	20.00°
Fourth hour after alcohol	17.063	20 833	37.90°	37.25°	—.65°	20.30°
Fifth hour after alcohol	17.916	17.916	37.25°	37.25°	±.co°	18.80°
Sixth hour after alcohol	13.698	14.443	37.25°	37.10°	—.15°	18.80°

SECOND SERIES.—*Commercial Alcohol, Sp. Gr. .835, injected Hypodermically.*

Experiment 7.—Dog; weight, 7.71 kilos; dose, 1.25 c.c. per kilo.

	Hourly heat production.	Hourly heat dissipation.	Rectal temperature.			Average room temperature during hour.
			Beginning of hour.	Ending of hour.	Gain or loss (+ or —).	
Before alcohol	21.575	22.500	39.05°	38.90°	—.15°	20.25°
First hour after alcohol	21.467	22.083	38.90°	38.80°	—.10°	20.80°
Second hour after alcohol	20.217	20.833	38.80°	38.70°	—.10°	19.65°
Third hour after alcohol	21.232	20.000	38 70°	38.90°	+.20°	19.73°
Fourth hour after alcohol	21.032	20 416	38.90°	39.00°	+.10°	20.05°
Fifth hour after alcohol	21.141	20.833	39.00°	39 05°	+.05°	20.50°
Sixth hour after alcohol	19.474	19.166	39.05°	39.10°	+.05°	20.37°

Experiment 8.—Dog; weight, 8 61 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	21.66	20.29	39.20°	39.00°	—.20°	16.70°
First hour after alcohol	17.88	19.95	39.00°	38.70°	—.30°	17.27°
Second hour after alcohol	18.43	19.81	38.70°	38.50°	—.20°	18.00°
Third hour after alcohol	16 80	17.49	38.50°	38.40°	—.10°	18.70°
Fourth hour after alcohol	16.66	16.66	38 40°	38.40°	±.00°	19.13°
Fifth hour after alcohol	14.10	15.83	38 40°	38.15°	—.25°	19.40°
Sixth hour after alcohol	15.05	16.78	38.15°	37 90°	—.25°	18.60°

Experiment 9.—Dog; weight, 7.71 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	21.666	21.666	39 20°	39.20°	±.00°	17.10°
First hour after alcohol	18.720	20.000	39.20°	39.00°	—.20°	17.80°
Second hour after alcohol	17.633	20.833	39.00°	38.50°	—.50°	17.75°
Third hour after alcohol	16.220	17.500	38.50°	38.30°	—.20°	17.70°
Fourth hour after alcohol	16.666	16.666	38.30°	38.30°	±.00°	17.80°
Fifth hour after alcohol	16.793	15.833	38.30°	38.45°	+.15°	18.45°
Sixth hour after alcohol	16.256	15.986	38.45°	38.49°	+.04°	17.15°

Experiment 10.—Dog; weight, 11 kilos; dose, 5 c.c. per kilo.

Before alcohol	21.680	25.000	39 05°	38.90°	—.15°	19.33°
First hour after alcohol	27.916	27.916	38.90°	38.90°	±.00°	18.77°
Second hour after alcohol	21.156	22.916	38.90°	38.70°	—.20°	18.90°
Third hour after alcohol	20.276	22.916	38.70°	38.40°	—.30°	18.87°
Fourth hour after alcohol	16.850	21.250	38.40°	37.90°	—.50°	19.23°
Fifth hour after alcohol	20.786	21.666	37.90°	37.80°	—.10°	19.20°
Sixth hour after alcohol	16.666	16.666	38.80°	38.80°	±.00°	19.50°

Experiment 11.—Dog; weight, 8.617 kilos; dose, 5 c.c. per kilo.

Before alcohol	18.914	21.666	39.30°	38.90°	—.40°	16.75°
First hour after alcohol	20.489	20.833	38.90°	38.85°	—.05°	17.00°
Second hour after alcohol	16.831	19.583	38.85°	38.35°	—.50°	16.90°
Third hour after alcohol	17.374	18.750	38.35°	38.10°	—.25°	16.95°
Fourth hour after alcohol	19.031	18.333	38.10°	38.20°	+.10°	16.95°
Fifth hour after alcohol	16.124	17.500	38.20°	38.00°	—.20°	17.15°

Experiment 12.—Dog; weight, 7.94 kilos; dose, 5 c.c. per kilo.

Before alcohol	23.076	19.583	38.90°	39.45°	+.55°	16.60°
First hour after alcohol	21.718	23.750	39.45°	39.13°	—.32°	16.65°
Second hour after alcohol	17.429	21.250	39.13°	38.53°	—.60°	16.45°
Third hour after alcohol	16 676	17.916	38.53°	38.33°	—.20°	17.00°
Fourth hour after alcohol	17.083	17.083	38.33°	38.33°	±.00°	16.80°
Fifth hour after alcohol	15.008	15.833	38.33°	38.20°	—.13°	16.80°
Sixth hour after alcohol	17.618	16.666	38.20°	38.35°	+.15°	17.65°

THIRD SERIES.—*Squibb's Absolute Alcohol, given by the Stomach, diluted with from Fifty to Seventy-five Per Cent. of Water.*

Experiment 13.—Dog; weight, 12.813 kilos; dose, 2.5 c.c. per kilo.

	Hourly heat production.	Hourly heat dissipation.	Rectal temperature.			Average room temperature during hour.
			Beginning of hour.	Ending of hour.	Gain or loss (+ or —).	
Before alcohol	23.542	24.875	38.58°	38.45°	—.13°	21 13°
First hour after alcohol	20.690	24.278	38.45°	38.10°	—.35°	21.26°
Second hour after alcohol	16.813	22.963	38.10°	37.50°	—.60°	21.39°
Third hour after alcohol	20.423	20.833	37.50°	37.46°	—.04°	21 76°
Fourth hour after alcohol	21.687	19.022	37.46°	37.70°	+.26°	21.80°
Fifth hour after alcohol	21.051	19.001	37.70°	37.90°	+.20°	21.46°

Experiment 14.—Dog; weight, 6.349 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	8.586	12.040	39.22°	38.90°	—.68°	20.50°
First hour after alcohol	9.622	12.316	38.90°	38.35°	—.55°	21.40°
Second hour after alcohol	7.793	10.587	38.35°	37.80°	—.55°	21.45°
Third hour after alcohol	9.045	9.553	37.80°	37.70°	—.10°	22.80°
Fourth hour after alcohol	10.284	10.030	37.70°	37.75°	+.05°	22.60°
Fifth hour after alcohol	13.060	12.806	37.75°	37.80°	+.05°	22.72°

Experiment 15.—Dog; weight, 10.204 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	17.527	20.700	38.60°	38.15°	—.45°	23.10°
First hour after alcohol	21.375	20.559	38.15°	38.25°	+.10°	23.45°
Second hour after alcohol	13.656	19.768	38.25°	37.50°	—.75°	23.25°
Third hour after alcohol	15.012	15.828	37.50°	37.40°	—.10°	23.60°
Fourth hour after alcohol	14.369	12.737	37.40°	37.60°	+.20°	23.60°
Fifth hour after alcohol	14.450	12.818	37.60°	37.80°	+.20°	23.36°

Experiment 16.—Dog; weight, 7.029 kilos; dose, 2.5 c.c. per kilo.

Before alcohol	13.232	13.513	38.55°	38.50°	—.05°	21.95°
First hour after alcohol	11.506	15.161	38.50°	37.85°	—.65°	22.32°
Second hour after alcohol	15.589	14.746	37.85°	38.00°	+.15°	22.29°
Third hour after alcohol	11.646	12.208	38.00°	37.90°	—.10°	23.27°
Fourth hour after alcohol	12.664	12.383	37.90°	37.95°	+.05°	23.22°
Fifth hour after alcohol	13.194	12.632	37.95°	38.05°	+.10°	24.49°

Experiment 17.—Dog; weight, 5.9 kilos; dose, 5 c.c. per kilo.

Before alcohol	10.733	14.131	39.45°	38.73°	—.72°	22.63°
First hour after alcohol	9.149	12.123	38.73°	37.90°	—.63°	22.70°
Second hour after alcohol	6.757	9.589	37.90°	37.30°	—.60°	22.96°
Third hour after alcohol	3.834	5.250	37.30°	37.00°	—.30°	23.25°
Fourth hour after alcohol	1.590	3.950	37.00°	36.50°	—.50°	24.45°
Fifth hour after alcohol	5.812	5.340	36.50°	36.60°	+.10°	25.06°

Experiment 18.—Dog; weight, 11.111 kilos; dose, 5 c.c. per kilo.

Before alcohol	15.215	19.215	38.95°	38.50°	—.45°	20.34°
First hour after alcohol	23.167	27.167	38.50°	38.05°	—.45°	20.60°
Second hour after alcohol	10.654	14.210	38 05°	37.65°	—.40°	21.50°
Third hour after alcohol	15.125	14.681	37.65°	37.70°	+.05°	23 69°
Fourth hour after alcohol	14.914	13.852	37.70°	37.85°	+.15°	22.92°
Fifth hour after alcohol	15.915	14.137	37.85°	37.05°	+.20°	23.54°

In all of the experiments in the second series production was subnormal throughout, with the exception of the first hour in Experiment 10 and the first and fourth hours in Experiment 11. Dissipation was always subnormal, excepting during the first hours in Experiments 10 and 12. With the exception of Experiment 7, the mean heat dissipation was

greater than production, with the result of a lowering of the animal's temperature.

In the third series, in which Squibb's absolute alcohol was given diluted by the stomach, we do not find any notable differences from the records in the first series, with which they are more consistently compared. Experiments 13, 14, 15, and 16 were performed with doses of 2.5 c.c. per kilo. In Experiment 13 heat production was always less than normal, notably so during the first and second hours. Heat dissipation, while less than normal, was in excess of production during the first, second, and third hours, and less during the fourth and fifth; but, as a mean, greater, so that temperature was less than normal. In Experiment 14 the variations in heat production were little, but tend above normal, for only during the second hour was it less. Dissipation was above normal during the first and sixth hours, and, with the exception of the fifth and sixth hours, less than production. The excess of dissipation over production was so marked that a decided fall in the bodily temperature occurred. In Experiment 15 both production and dissipation were subnormal, excepting the former during the first hour, when an increase was observed. Dissipation was in excess of production, excepting during the fourth and fifth hours, and on the whole, much in excess, with a consequent diminution in temperature. In Experiment 16 but little action was manifest. The mean production and dissipation not much altered; dissipation, on the whole, was in excess of production, causing a fall of temperature. In Experiments 17 and 18, in which 5 c.c. per kilo were given, we have illustrations of curious differences, which demonstrate the uncertainties of similar doses under apparently the same conditions. In Experiment 17 both production and dissipation were always subnormal, with dissipation always notably in excess, excepting during the last hour, when it was slightly less. Owing to this difference, the animal's temperature underwent a marked and progressive diminution until the last hour, when a slight change occurred in the direction of the normal. In the last experiment both heat production and dissipation were decidedly increased during the first hour, both fell below the normal during the second hour, heat production going slightly above during the third hour, and remaining near the normal subsequently, while heat dissipation during these hours remained below normal. Dissipation, as a whole, being in excess of production, a fall of temperature occurred, which continued throughout.

It is evident that the predominant feature in all these experiments, with the exception of Experiments 1 and 4, is the excess of mean heat dissipation over mean heat production, and, as a consequence, with the production of a diminution of bodily temperature. In only the two experiments alluded to was the mean production in excess, with the result of an increased temperature throughout. In but two other experiments—7 and 15—was a rise of temperature above normal observed at any time during the period of observation, in Experiment 7 there being an increase of .2° during the third, fourth, fifth, and sixth hours, and in Experiment 15 an increase of .1° during the first hour.

As a second feature, it will be observed that in all the experiments, with the exception of Experiments 3 and 18, the mean heat dissipation was subnormal. In Experiment 3 production was also above normal, although less increased than dissipation, while in Experiment 18 the difference is of a similar nature, but somewhat greater, and, as a result, a more decided diminution of temperature.

A third feature and scarcely less marked is the distinct lessening of the amount of heat produced, which, however, is not as constant, and is noted in thirteen of the eighteen experiments. The mean* per cent. change in one direction or the other is presented in the following table:

Number of experiment.	Dose per kilo.	Per cent. mean gain (+) or loss (—) in heat production.	Maximum gain (+) or loss (—) in rectal temperature.
1.....	1.25	+ 22.8	+ 0.40°
2.....	2.50	+ 15.6	— 0.80°
3.....	2.50	+ 8.6	— 0.55°
14.....	2.50	+ 16.0	— 1.20°
18.....	5.00	+ 4.9	— 0.85°
4.....	2.50	— 27.9	+ 0.55°
5.....	2.50	— 17.9	— 1.23°
6.	5.00	— 24.5	— 2.30°
7.....	1.25	— 3.8	— 0.20°†
8.....	2.50	— 23.9	— 1.10°
9.....	2.50	— 27.1	— 0.70°
10.....	5.00	— 5.2	— 1.10°
11.....	5.00	— 4.9	— 0.90°
12.....	5.00	— 23.8	— 1.25°
13.....	2.50	— 14.5	— 0.99°
15.....	2.50	— 11.2	— 0.75°
16.....	2.50	— 2.4	— 0.60°
17.....	5.00	— 42.7	— 2.23°

* This is obtained by finding the total heat production after giving the alcohol, and determining the hourly averages.

† Followed by a rise of .2° above the normal.

This diminution of heat production is altogether fallacious, as far as any direct action of alcohol is concerned, since it, as a whole, is practically no more than that which occurs in normal animals under similar conditions. In nine experiments on normal animals during six consecutive hours, at the same time of day, the average heat production during the first hour was 26.130 kilogramme degrees, a steady decline was observed, and at the sixth hour the average production was 20.614 units. In the thirteen alcohol experiments the mean heat production during the first hour was 20.907 units, a similar steady decline was observed, and at the sixth hour (fifth after alcohol) but 16.117 units were produced. In normal animals the diminution was 21.1 per cent., and in the alcohol experiments 22.9 per cent. The difference is so trifling, and as likely due to accidental causes as to the drug, that we may safely conclude that alcohol is without specific action on thermogenesis, at least so far as any is apparent in the actual quantity produced. In normal animals occasionally an increase of production is observed. This, doubtless, is a partial explanation of the cause of increased production in some of the experiments.

In the fourth column of the table will be found the maximum alterations in the temperature of the animal. It will be noticed that in only three of the experiments—1, 4, and 7—was the temperature at any time above the normal. In Experiment 1 it was always above normal; in Experiment 4 about normal during the first two hours, then going above; and in Experiment 7 fell .2° during the first two hours, then passed .2° above normal, reaching this point at the end of the sixth hour. A matter of great importance is the fact that in only one of the five experiments in which heat production was *increased* was there a *rise* of temperature, while in the other four a diminution occurred, ranging in the four experiments from .55° to 1.20°. In the thirteen experiments in which heat production was diminished, a diminution of temperature was always noted, excepting in Experiment 4, where it was normal or hypernormal, and Experiment 7, where it was subnormal during the first two hours, afterwards normal or above it. The uncertainty of temperature alterations indicating the condition of activity of thermogenesis is apparent by a comparison of the changes in heat production and temperature in this table or in the records.

The diminution of temperature is usually well marked although the effect of a given dose varies within wide limits. The larger the dose, however, the greater the probability of a more pronounced effect. In the two experiments in which the dose was 1.25 c.c. per kilo, in one an increase occurred of .4°, and in the other a decrease of .2°, followed by a similar increase. In ten experiments where the dose was 2.5 c.c., in eight by the stomach and two hypodermically, in one a rise occurred equal to .55°, in the others a maximum diminution of .8°, .55°, 1.20°, 1.23°, 1.10°, .70°. .99°, .75°, and .60°, respectively, or an average of .88°. In six experiments, with doses of 5 c.c. per kilo, in three by the stomach and three hypodermically, the diminution was .85°, 2 30°, 1.10°, .90°, 1.21°, and 2.23°, respectively, or an average of 1.44°. The maximum diminution in one experiment occurred during the first hour, in four during the second hour, in five during the third, in four during the fifth, and in two during the sixth.* The dose obviously has an influence on the time of occurrence of the maximal diminution. Leaving out the three experiments where an increase of temperature was noted, or the smallest dose used, in eight experiments where the dose was 2.5 c.c., the mean time of greatest diminution is two and three-quarters hours, and in seven experiments where the dose was 5 c.c. the mean time is three and sixth-sevenths hours. The effects, therefore, of larger doses, as a whole, are more prolonged and pronounced.

In normal animals a composite curve of rectal temperature records shows that a steady decline occurs, most marked during the first three hours, reaching its maximum during the fifth hour, and equal to .35°. A similar curve constructed from alcohol records shows that the greatest diminution occurs during the third hour (second after alcohol), equal to 1.19°; a rise (.39°) then occurs and the temperature remains about the same to the sixth hour of the experiment. In normal experiments the diminution from the first to the third hour was .24°, so that the difference between .24° and 1.19° = .95° represents the actual alteration produced by the alcohol for a mean dose of 3.2 c.c. per kilo.

It seems accordingly clearly established from these records that the characteristic action of alcohol on the animal heat functions is to cause relative to heat production an excess of heat dissipation and thus lower bodily temperature. Why in certain experi-

* Only eleven of the eighteen experiments were carried out for six hours.

ments the reverse of this should occur is yet to be determined. Doubtless the explanation is to be found in a complex action of the drug on the processes concerned in, or closely related to, the heat mechanism and thus affecting it. First, it is obvious that there is a reciprocal relation existing between the functions of heat production and heat dissipation, so that a primary alteration in one will induce a sympathetic change in the other; accordingly if heat dissipation is unduly increased, as when we are exposed to cold, heat production becomes also increased to make up for the excessive loss; or, should heat dissipation be diminished, heat production would tend to be similarly affected to prevent unnecessary loss of energy or an abnormal increase in bodily temperature. Therefore all conditions which primarily affect the quantity of heat dissipated will affect indirectly the activity of thermogenesis. Second, it seems to be an established fact that alcohol causes a dilatation of the cutaneous capillaries, accordingly the amount of blood exposed to the cooling influences of the surroundings is increased, and, as a consequence, heat dissipation facilitated. Therefore alcohol would thus tend to increase heat dissipation, and, since dissipation is increased, it is obvious that the effect of this would be indirectly to increase thermogenesis to make up for the greater loss. In fact, however, when animals are subjected in the calorimeter to such studies, the characteristic effect is to diminish heat production. It will thus be observed that we have here two opposing factors affecting heat production, one indirectly tending to increase it through vaso-motor alterations, and the other to decrease it, probably through direct action on thermogenic centres. Hence, whether or not in any given case heat production would be increased or diminished, or what the relation of heat production and heat dissipation would be, would depend, other things being equal, to the relative values and relations of these two factors. Added to these is undoubtedly a third factor, which further complicates the action. There can be no doubt that alcohol undergoes decided molecular alterations on entering the blood. The fact that about ten per cent. or more almost instantly disappears in the living blood, that but a very small percentage is eliminated as such, and that but traces exist even after large doses after the lapse of twenty-four hours, all point conclusively in this direction. While it is admitted that we do not know the exact changes which occur in this substance, it is opposed to all knowledge of the chemical processes in the animal organism to suppose that the molecule is rendered more complex; while, on the other hand, there is reason to believe that it undergoes destructive changes through oxidation, yielding simple products, such as CO_2 and H_2O, and energy in the form of heat. Since each gramme of alcohol yields about nine kilogramme degrees, the amount of heat evolved from a moderate dose, as already shown, may be considerable. Consequently, the rapidity with which heat would thus be generated may be a matter of great moment in affecting the thermal output during a given period of time. Hence it follows that even though certain conditions connected with the method of experiment generally tend to diminish heat production nearly one-fifth, yet the number of heat units arising from the probable oxidation of the drug might more than compensate for such a loss. Added to this there may be a temporary increase in the quantity of heat formed as a result of the continued fluctuations in the activity of thermogenesis under normal conditions. Moreover, while the quantity of heat formed after the ingestion of alcohol is practically unaltered, yet the tissue change may be actually diminished, as is indicated in the probable lessening in the amounts of CO_2, urea, and other effete matters eliminated, the lack of heat thus resulting being made up by the destruction of the alcohol with the formation of new and unknown derivatives. Consequently, the study of the action of alcohol on animal heat functions is, doubtless, one of great complexity, in which we have, as important factors, the effects produced by and inseparable from calorimetrical methods or other associated circumstances; the considerable and inexplicable fluctuations which occur in the heat processes in normal animals; the action of the drug upon the circulation affecting indirectly, and likely directly, these processes; the probable generation of heat as a result of the oxidation of alcohol; and possibly an action directly or indirectly diminishing tissue metamorphosis. Some of these being directly antagonistic, it is obvious that the nature of the results following the ingestion of alcohol will depend upon their relative degrees of intensity, and, as a consequence, the variations which occur are not without explanation.

In conclusion, these experiments, as a whole, show clearly that alcohol does not

affect the total quantity of heat produced; that more heat is dissipated than produced; that the fall of temperature is due to the excess of dissipation and is in direct proportion; and that in all likelihood alcohol by undergoing oxidation yields energy in the form of heat, thus conserving the tissues and acting as a food.

HYDRASTININE IN UTERINE HEMORRHAGE.

By Edmund Falk, M.D., Berlin.*

In the medical treatment of uterine hemorrhage we were limited to the employment of ergot, until, in the year 1883, Professor Schatz, at the meeting of naturalists at Freiburg (*Arch. f. Gyg.*, xxii., Heft. 1 u. 2) recommended *Hydrastis Canadensis*,—a remedy whose favorable results have secured for it introduction into the materia medica.

Hydrastis is said to owe its action to two alkaloids,—hydrastine and berberine. Nevertheless, neither of the alkaloids succeeded in finding the same employment as the fluid extract; therapeutically they were accorded only transient employment, and their pharmacological action was scarcely tested at all by German investigators. I made it my task to take up the investigation of the pharmacological action of hydrastine, and while thus engaged found sufficient reasons for the failure of hydrastine to meet with adoption.

At the suggestion of Dr. Langgaard, I extended my investigations to an oxidation product of hydrastine,—the hydrastinine prepared by Dr. Freund,—and found that this exhibited in the fullest measure those pharmacological properties which we expect in a remedy intended for the restraining of internal hemorrhages.

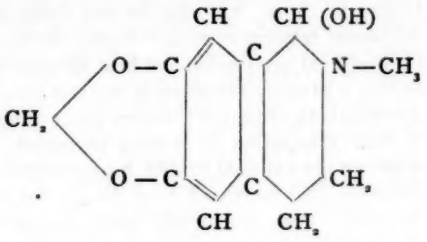
The hydrastinine is formed, as has been found by Freund and Will, from the hydrastine, by oxidation, the latter splitting up into the base hydrastinine and into an acid,—opianic acid. If the hydrastine be gently warmed, diluted with nitric acid, and the product precipitated with alkali, we obtain the new base—the hydrastinine—in an almost pure condition.

From $C_{21}H_{21}NO_6 + O + H_2O$
(Hydrastine.)

arises $C_{10}H_{10}O_5 + C_{11}H_{13}NO_3$.
(Opianic acid.) (Hydrastinine.)

* From the Pharmacological Institute of the University of Berlin, Germany.

According to private statements of Dr. Freund, the hydrastinine is a derivative of isochinolin. Its formula may, with great probability be stated thus:



The hydrastinine in pure condition is perfectly white, melts in the test-tube at 116° to 117° C. The base contains a molecule of H_2O, so firmly bound that, on recrystallization from solvents free from water, it does not yield up this molecule; the salts, however, do not contain it. Hydrastinine is soluble in alcohol, ether, and chloroform with extreme facility; more difficultly soluble in warm water, and with most of the acids it forms in H_2O readily soluble salts. The hydrochlorate, $C_{11}H_{11}NO_2HCl$, is readily soluble in water; the solution exhibits slight fluorescence, possessing, with the free base, an intensely bitter taste, and is optically inactive. The action of hydrastinine upon the animal organization I have tested in frogs and rabbits.

I made my experiments in the Pharmacological Institute of the University of Berlin, employing the pure preparation furnished by Parke, Davis & Co., of Detroit, U.S.A. To Professor Dr. Liebreich and Dr. Langgaard I desire to express my sincere thanks for their kindly support in my labors.

In its application to frogs, hydrastinine acts as a paralyzing agent. The paralysis is purely central, because after ligation of the left iliac artery and subsequent injection of hydrastinine muriate under the skin of the back, we observe the occurrence of paralysis of the left posterior extremity, concurrent with that of the remainder of the body. The ischiatic nerves respond in like degree to the electrical current. In the case of toxicity produced by hydrastinine, sensibility remains undisturbed, without elevation of reflex action. Local symptoms of irritation are not produced by hydrastinine; from the point of injection, reflex actions are distributed in like manner as from all other superficial parts of the body.

Hydrastinine acts as a heart stimulant

The heart shows a disposition to remain in systole, displaying a tendency before the diastole is completed to renew its contraction, and therefore cause an acceleration of the pulse; with the result, however, of later on bringing about a diminution of the pulse by reason of the heart remaining longer in systole. This effect is observable also in the isolated frog's heart, which, for this purpose, is enclosed in William's apparatus, and the circulation of which is kept up by means of sodium chloride solution. We therefore observe from the curves that before the tracer in its downward movement has reached the originally lowest point of pressure a new elevation occurs, and only before the second or third pulsation do we reach the recognition of pronounced diastole. Should after several pulsations no decided diastole occur, the pulse-waves become smaller, the blood-pressure is increased, as also the frequency of the pulse. Even large doses of hydrastinine, however, do not produce complete cessation of the heart's action. Hydrastinine is, therefore, in contradistinction to hydrastine, which causes cessation of the heart's action by paralysis, not a cardiac poison.

Even in the case of warm-blooded animals, a noticeable symptom of the toxic action of hydrastinine is a paralysis, which, in the instance of rabbits, ensues after the injection of .15 gramme (2 grains) of hydrastinine to every 1000 grammes (2 pounds) of body weight. In the advanced stages of intoxication the animal remains motionless, the limbs outspread, the head depends for its support on the table, the pupils enlarge, the visible vessels strongly contracted. The breathing is slight dyspnœic, though sensibility remains intact. In poisonous doses—.25 gramme (4 grains) to .3 gramme (5 grains) to every 1000 grammes (2 pounds) of body weight—the dyspnœa becomes more and more pronounced, and with the occurrence of clonic or clonic-tonic convulsions and cramps, as we observe in the case of suffocation, breathing ceases, and finally death ensues.

Of a special interest to us in the study of hydrastinine is the fact that it produces a decided vascular contraction. As a measure of this contraction, we may make use of the increase of blood-pressure, which, in the case of hydrastinine, is decidedly stronger and more permanent than with hydrastine. In the case of the latter, while I have observed usually an increase of blood-pressure of from ten to twenty millimetres, never, however over thirty millimetres above the normal, when under the influence of hydrastinine the pressure was never less than fifty millimetres, reaching even as high as eighty to one hundred millimetres. That in reality the elevation of blood-pressure is dependent or contingent upon vascular contraction is shown by the alteration or formation of the tracings. The strong vascular tension is evidenced in the character of the sphygmographic tracings, in the decrease in degree of the dicrotic wave and the appearance of waves due to the elasticity of the blood-vessels.

At the same time, however, the action of the heart becomes slower and stronger; the individual pulse-waves, therefore, become higher. No irregularity of the heart's action occurs. Only in the case of intravenous injections of hydrastinine we observe an immediate effect of the agent upon the muscles of the heart, producing several distinct systoles before the diastole is complete. As in the case of cold-blooded animals, so also we find in the case of warm-blooded organisms that the contractility of the heart-muscle is increased by hydrastinine.

The slowing of the pulse, which occurs during the increase of blood-pressure, is conditioned by an irritation of the central vagus nerves. This does not, however, occur if the vagus nerves are divided before the injection of hydrastinine. Whereas, in the use of hydrastine, the excitation of the vaso-motor centres is followed by a paralysis, and the blood-pressure correspondingly is lowered temporarily fifty to ninety millimetres, with hydrastinine the vascular tension remains uniformly high, and the lowering of the blood-pressure, shortly before death, is dependent upon cessation of breathing, but is not due to a paralysis of the vessels. It is, therefore, possible for us, by employing artificial respiration, to raise the blood-pressure from its low ebb, and postpone dissolution almost at will.

The vascular contraction is undoubtedly conditioned or produced by a direct action on the vessels themselves, because, when we produce a complete paralysis of the vaso-motor centres by large doses of chloral hydrate, no increase of blood-pressure results. As hydrastinine displays a tendency to produce in the isolated frog's heart a quite pronounced contraction, it is capable in warm-blooded animals of bringing about a lasting contraction of the peripheral vessels by its action on the muscular elements thereof and on the nerve termini.

As an illustration of the action of hydrastinine, I adduce the following experiment on a curarized rabbit, which previously had been provided with a canula in the left ureter in order to determine the behavior of the urinary secretion.

The blood-pressure, estimated by means of the Hürtel manometer, in the case of a rabbit, weighing 2050 grammes, was before the injection 110 to 150; the average amount of urine in three minutes amounted to four drops. Fourteen minutes after the subcutaneous injection of .4 gramme (6 grains) of hydrastinine muriate, at 2.10 P.M., the blood-pressure was increased from 160 to 215; evacuation of urine, 0. In accordance with the periodic action of hydrastinine at the beginning of the experiment, at 2.20 the blood-pressure amounted from 120 to 155; and between 2.17 and 2.20 nine drops of urine were voided. The decrease in the secretion of the urine, high blood-pressure existing, was repeated several times between 2.23 and 2.26. With a blood-pressure of 180 to 250, the amount of urine observed at 2.22 was only half a drop; at 2.36 to 2.38, with a pressure of 175 to 230, one drop. Following this, at 2.40, a complete anuria ensued, which lasted until 3.22, death following. Dissection discloses that the ureter is not enlarged; pressure on the kidney empties from the canula only one drop of clear urine. Therefore the vascular contraction produced by hydrastinine in the abdominal organs is so great as to cause an entire cessation of the urinary secretion, for the reason that the contracted vessels do not permit a sufficient amount of blood to flow through the kidneys.

Before devoting special attention to the therapeutics of the agent involved, I preface the matter by a comparison of the action of hydrastine and hydrastinine. Time does not permit us to discuss at length the features of hydrastine, and therefore I must refer to my work published in *Virchow's Archiv.*

HYDRASTINE.

1. Produces a tetanic condition, beginning with an intensification of reflex activity. In the case of cold-blooded animals, a condition of complete paralysis follows, dependent upon a paralysis of the motor sphere of the spinal tract. In the case of warm-blooded animals, usually the paralytic condition precedes the tetanic stage.

2. It paralyzes the heart, and, in the case of cold-blooded animals, first the cardiac inhibitory ganglia. Thereafter the automatic ganglia are paralyzed. Even in the case of warm-blooded animals it is a cardiac poison.

3. It has a local influence on the muscular system.

4. It produces, through irritation of the vaso motor centres, an increasing vascular tension and increase of blood-pressure. This is, however, comparatively slight, not lasting, but interrupted by a lowering of the blood-pressure and contractility of the vessels, especially during the tetanic convulsive stage of the poisoning.

5. During the tetanic attack a slowing of the pulse occurs, due to irritation of the vagus centres. An identical occurrence is observed in the slowing of pulse in the advanced stages of poisoning.

6. Subsequent to the irritation of the vaso-motor centres, we find that a paralysis follows, to which is due the gradual loss of power in muscular contraction of the vessels, the lowering of blood-pressure, and final collapse.

7. Death occurs by reason of heart paralysis.

HYDRASTININE.

1. In both warm- and cold-blooded animals this substance paralyzes, by means of its action on the motor sphere of the spinal cord, and a tetanic stage is not produced.

2. It increases the contractile power of the heart-muscle. It is not a cardiac poison.

3. It has no local effect on the muscular tract.

4. It produces vascular contractions by its action on the vessels themselves, resulting in increased blood-pressure, which, in the beginning, is periodic and quite pronounced, persistent, and not interrupted by any symptoms of relaxation.

5. Concurrently with the increase of blood-pressure, we find an irritation of the vagi, which produces a slowing of the pulse.

6. At death the lessening of blood-pressure is of a secondary nature, not dependent upon a relaxation of the blood-vessels, and removable by means of artificial respiration.

7. Death ensues in consequence of paralysis of the respiratory centres.

The above comparison, showing the absence of irritation of the spinal nerves, the favorable action upon the heart, and persistent contractility of the vascular system due to hydrastinine, convinces us that the latter is better suited for therapeutical employment than hydrastine,—the active principle of *Hydrastis Canadensis.* On the other hand, the absence of an action on the muscu-

lar portion of the tissues is a powerful argument for the subcutaneous injection of this remedy. Inasmuch as rigidity of the muscles ensues upon the injection of hydrastine in cold-blooded animals, contrasting this effect with the action of hydrastinine, we find, neither in the case of warm- or cold-blooded animals, any symptoms of irritation. In the first case, with hydrastinine, we find reflexes, having for their central point the moment of injection, and not resolvable by the use of the electrical current.

After an injection in my own person of 1 gramme (16 drops) of a five per cent. solution subcutaneously in the forearm, I have become convinced that really no irritation occurs. The injection is not any more painful than one prepared from cocaine. Directly after its use, in the neighborhood of the puncture, there was a feeling of cold and insensibility, otherwise nothing was observed of any moment, either subjective or objective.

Through the friendly offices of Dr. Landau, I had an opportunity of observing the therapeutic effects of this remedy in his private clinic.

The patients who were treated in this clinic were affected with uterine hemorrhages, hydrastinine being the remedy employed. Even though the injections could not be given with necessary punctuality and regularity, and in consequence of which the treatment was more or less interrupted, we have, however, recognized that, the patients remaining under their usual surroundings, the element of rest, which must be considered in hospital practice, was not a factor in influencing the results. This element should have been, if accessible, of importance in producing a favorable result.

Of the patients which I have had in hand until the end of October, who were treated with hydrastinine, I can name twenty-six successful cases. On the one hand, it must be taken into account that the treatment was systematic, and means of comparison are offered, especially in view of the fact that no other treatment was employed. These twenty-six patients received as a total four hundred injections of hydrastinine muriate in the form of a solution varying from five to ten per cent. I have never discovered after the use of these injections any noticeable or noteworthy cases of local irritation; never any abscesses. On the other hand, it is not always possible to avoid the infiltrations which cause a temporary swelling. These local effects disappear, however, after a few days, being disconnected with any sensation of pain, except when pressure is applied. After injection, according to the statements of the majority of the patients, there is a slight burning sensation, but no sensation which can be regarded as painful. Numerous patients treated with hydrastinine had heretofore been injected with solutions of ergotin, and they unite in praising the painlessness of hydrastinine. No untoward results follow its use, nor does any pain of a lasting character ensue. "I would rather have three injections of this remedy than one of ergotin." This was the answer given to my question as to whether the injection caused any pain. The use of hydrastinine is debarred in cases of neurotic patients, in which, owing to frequent and persistent hemorrhages, the use of ergotin, abrasion of the uterus, laparotomy, ovariectomy have been employed without results, because the pains subsequent to injection are too violent, and, after each injection, nausea and frequently vomiting occurred.

In the case of an anæmic patient who frequently suffered from fainting spells, and who displayed this tendency several times on the day of the first injection, a syncope resulted which lasted but for a few minutes. With continued use of hydrastinine, the fainting spells became rarer, in exact accordance with diminution of hemorrhage. I must here, however, note the fact that the patients frequently state that they experience after an injection, at times varying from one-half to one hour afterwards, a slight pain, resembling contractile or labor-pains, usually lasting for several hours. One patient, who had had no children, represented her impressions as if the abdomen had been constricted. It must be further stated, as subsequent to this pseudo-labor-pain, especially in cases of endometritis, a hemorrhage frequently occurs, lasting from a half-hour to several hours. In thus communicating these slight drawbacks, I have imparted everything with which I am familiar as direct results of the injection.

I have employed hydrastinine therapeutically in menorrhagia and metrorrhagia without observing any local effects; also in cases of hemorrhage which were dependent upon metritis, endometritis, and pyosalpinx; and, lastly, in a number of cases of myoma.

A description of the several cases must be reserved for my article intended for the *Archiv für Gynäcologie*, and we must here be contented with a summary or condensed review of the entire results:

In seven cases of metrorrhagia, in which hydrastinine was employed, in which any anatomical lesions were absent, the remedy proved or established its usefulness as decided; in congestive dysmenorrhœa, during its use, menstruation progressed without the occurrence of congestive troubles, the hemorrhage was much decreased, and the period shortened. An equally good result was obtained in the metrorrhagia of a virgin uterus. In all the cases observed, in which menstruation occurred every fourteen days, and had a duration of from eight to twelve days, the application of hydrastinine injections resulted in shortening the period to five days, with an interval of from five to five and a half weeks, with a noticeable increase of strength.

In the case of ovarian hemorrhages, noticeable in the instances of pronounced hysteria, no satisfactory results were obtained in two cases. In one of these a decided neurosis existed, in which the use of hydrastinine had to be discontinued. In the second case, in which abrasion of the uterus, and ergotin had been employed without results, though the menstruation immediately after the use of hydrastine decreased noticeably, its recurrence was of like irregularity and quantity as in former cases.

In two cases of pyosalpinx, hydrastinine was very serviceable, relieving the congestions of the genitals and decreasing the amount of hemorrhage. In eight cases of metrorrhagia the cause could be traced to endometritis, and, in reality, of these eight, three cases were complicated with chronic metritis. In the five cases in which only hyperplastic endometritis existed, I could perceive a decided improvement after the use of hydrastinine. In all cases menstruation had been previously very irregular. In several intercurrent hemorrhages, in others menstruation, occurred at intervals ranging from fourteen days to three weeks, lasting for a long time, naturally weakening the patients by loss of blood and other concurrent causes. These hemorrhages had been treated for some time, in the case of one patient, by repeated abrasion of the uterus, and in another by treatment with ergotin, but without results. In all of the five cases I succeeded in controlling the hemorrhages by treatment with hydrastinine, continued for from two to eight weeks. The intercurrent hemorrhages desisted, menstruation became regular, lasted only a short time, with a noticeable improvement of attendant symptoms. Women who usually were too weak to perform any work during the menstrual period, declared that after the injections they had gained sufficient strength to indulge in their usual avocations, and did not require the same amount of rest as formerly. It is necessary for me to state here that the improvement was not only temporary,—in other words, dependent immediately upon the injection,—but in several cases months have elapsed since the treatment without the recurrence of any irregularity in menstruation or hemorrhages. As formerly, no single month has elapsed without a recurrence of these abnormal conditions; the patients declare themselves cured.

Not as favorable results were obtained when the uterus was enlarged by hyperplasia of the connective tissue, in cases in which chronic metritis was concerned. However, in one case, in which the metritis and endometritis might be considered sequelæ of delivery, which had occurred two years previously, there was great loss of blood at the menstrual periods, as well as during the interval. Good results were obtained by the use of hydrastinine. The interval between menstrual periods was lengthened to about five weeks. The flow now lasts only a short time, is much less than formerly, and is without other annoying symptoms. The treatment having been discontinued during the succeeding two months, menstruation was regular, and, as far as the dimensions of the uterus were concerned, I note a contraction of from ten to eight centimetres. In two other cases I was unable to observe any satisfactory results. In one of these the intercurrent hemorrhages ceased, but the regular periodical flow was stronger than before.

Much better results were, however, obtained in nine cases of myoma of different character and involving difference in size, varying from the smallest incipient interstitial myoma to such a one of a subserous character, and of a size comparable to a child's head, in all of which cases more or less hemorrhage was the cause for complaint and treatment. After a few injections, the hemorrhage, which usually lasted from four to eight weeks, and had proved uncontrollable by ergotin, we found a lengthening of the period, and, in addition, a lapse of from five to seven weeks before its commencement; then only a slight loss of blood and a lessening of debilitating influences, dependent upon the process.

Out of twenty-six patients treated with hydrastinine there remain only four which

were not either improved or cured. The successful results can, therefore, be summed up as giving 84.6 per cent. of the cases. On the one hand, the hydrastinine has been used as a general remedy, without selection of the cases; and, on the other, because a large percentage had been previously treated with ergotin or by operative methods. Had I confined myself to a consideration of the treatment of hemorrhages, solely conditioned or dependent upon endometritis or myoma, or else menorrhagia of a purely congestive character, the percentage of recovery would have been notably higher.

A critical summary of the cases leads us to infer that curable instances are preferably those in which menorrhagia and metrorrhagia preponderate; also, those of congestive dysmenorrhœa, and in mild attacks of endometritis, by which the causation of too decided and too frequent hemorrhages are removed, define the boundaries of this treatment. I have not as yet at my disposal any experiences concerning the usefulness of hydrastinine in gynæcological practice. However, it is not unlikely that hydrastinine can exert a contractile effect on the vessels, and by that means influence the character and quantity of the hemorrhage, but it is also possible that it is an excitement or stimulant to the muscular structure of the uterus. In evidence of this position, we may adduce the fact that pains, resembling those of labor, and slight hemorrhages ensue after its injection, principally in cases of endometritis. An important question which must be considered is, How shall hydrastinine be employed? I frequently began its use during hemorrhage, and often found, in cases of endometritis, even after the first injection, a cessation of hemorrhage; in cases of myoma, after several. The most satisfactory results were, however, obtained, in cases of congestive dysmenorrhœa, or too profuse menstrual hemorrhage dependent upon structural changes of the uterus, when the treatment was adopted from six to eight days before the expected occurrence of the menstrual flow. I injected daily one-half syringeful of a ten per cent. solution, representing .05 gramme (¾ grain) of hydrastinine muriate; and, as soon as the hemorrhage commenced, a syringeful, representing .1 gramme (1½ grains), until its cessation. In cases of irregularity, I injected every other day, or perhaps two to three times a week, .05 gramme (¾ grain) of hydrastinine, using the following formula:

℞ Hydrastinine muriate, 1 gramme (15 grains);
Aq. dest., 10 grammes (150 gtt.).
D.S.—For subcutaneous injection. Dose, ½ to 1 syringeful.

As an experimental feature, I made use in the injections of a quantity reaching up to .15 gramme (2¼ grains), but discovered that these large doses offer no advantage over those previously employed, representing from .05 gramme (¾ grain) to .1 gramme (1½ grains) of the salt. It is noteworthy, however, that no bad results have been noted after the larger injection.

I may here remark that while the price of the hydrastinine is at present rather high, it should be remembered that the very moderate quantities needed—during each month not exceeding over 1 gramme (15 grains) for each patient—are not such as to preclude its employment for economical reasons.

GASTRIC ULCER, WITH FIBROID ENLARGEMENT AND INDURATION OF THE PYLORUS, OR CANCER (?).

By Chas. M. Mutz, M D., Topeka, Kansas.

MRS. JNO. DETTWEILLER, Halstead, Kansas, aged 38; mother of eight children; temperate in all things and of industrious habits; in stature below the medium; figure erect; general appearance good; previous to sickness and at this time weighing one hundred and thirty-four pounds. She has enjoyed fair health since childhood. In her ancestral history I find that her grandfather, on maternal side, suffered with some serious stomach-trouble in old age.

Mrs. D. favors her father in temperament and facial characteristics. During the first months of the year 1887 the patient felt some uneasiness in the epigastrium, not well localized, but diverting towards the right hypochondrium, and occasionally some dyspeptic symptoms were present. This uneasiness led to frequent self-examinations, and she claims she felt at times what seemed to her to be a tumor. A physician's advice was now sought, but his examination failed to reveal the tumor to him, and the dyspeptic symptoms alone received attention. The general health continued fair with this treatment throughout 1887 and with but slight increase of the local trouble. In May, 1888, the advice of Dr. T. Haering was obtained. He at

once discovered the tumor, and expressed his alarm regarding the outcome of the case in conversation with me. He did what he could to encourage the patient and treated the symptoms, giving time for a diagnosis. She remained under his care but a short time, however, and sought the advice of another physician of good reputation, who pronounced the case cancer of the stomach, and the husband was told that there was no hope. She treated with him for "cancer" about three weeks. The case at this time had so far progressed that she vomited from one to three times daily, and the epigastric pain had reached a decided severity at times. Her general health had suffered to the extent of reducing her weight to one hundred pounds.

The next physician consulted pronounced the case simply dyspepsia, and prescribed accordingly. After two weeks' treatment with this gentleman she had so far declined in strength as to be unable to leave the house, and, a few days after, her bed. At this time I was called. Found the patient in a semiprone position, vomiting and retching.

She was greatly emaciated, with an icteroid hue of the skin, temperature 97½°, complete anorexia, and unable to retain forced alimentation above thirty minutes to an hour, though for this space of time the ingesta frequently afforded some relief. The epigastric pain varied in intensity, also as to character. The gastric contents ejected were of the characteristic coffee-ground variety. I made a crude test for hydrochloric acid by pouring an aqueous solution of methyl-violet in the unfiltered ejecta. This test should change the violet to a distinctly blue color if the acid be present. No such change was observed. However, the test to be properly made, as directed by Dr. Woodbury, in his work on "Disordered Digestion and Dyspepsia," is to add a portion of the filtered gastric contents to a weak solution of the methyl-violet in a test-tube. This will give a reaction for 1¼ parts HCl in 1000 of the filtrate. The test being so delicate, even my crude method would not fail to show the presence of the acid. You will here be reminded of the diagnostic value of determining the presence or absence of hydrochloric acid in suspected cancer of the stomach.

Respecting further previous history of the case, as related by the patient, I will add that polydipsia and polyphagia had annoyed her from the beginning, as also had diarrhœa, which generally relieved the flatulence. She stated that the vomiting had been of the character described since about two months of this time.

Further physical examination revealed a tumor in the inferior right border of epigastric space, irregular in shape, and about the size of a fist of a medium hand. Its outer margin lay beneath the vertebro-costal cartilage. It was firm, not especially sensitive, easily movable on pressure beneath it, and moved slightly by action of diaphragm on inspiration. There was no marked enlargement of the liver, though that viscus presented a decidedly pathological firmness in the right hypochondriac region. There was a constipated condition of the bowels, which had succeeded a diarrhœa, four or five days previously. Tongue was slightly coated with a brownish fur, enlarged and soft; breath was offensive, ascites existed, and her countenance wore a *tedium vitæ* expression, though she did not realize the gravity of her condition. The treatment which she had received consisted of arsenical, mercurial, and vegetable alteratives, and digestives.

I prescribed hydrochlorate cocaine, ⅓ grain, with pure pepsin, 2 grains, to be given every two hours. This was continued twenty-four hours, then given every three hours, and in addition 20 drops of fluid extract of condurango and 1 grain of iodide of potassium was given every four hours. This treatment was continued five days with the most happy results. Vomiting had been reduced more than two thirds; pain and all unpleasant epigastric symptoms had been greatly mollified. She began to desire food, and small quantities of selected diet were allowed her at frequent intervals, portions, at least, of which were assimilated. Unfortunately, we got out of first cocaine and then condurango for one week. During this time vomiting increased and every untoward symptom was augmented, in spite of everything that could be done in the way of substitution. Improvement was again established as soon as the original treatment was entered upon, and I shortly made this additional prescription:

Strychninæ, grs. i;
Acid. sulphurosi, ℥i;
Aqua destil., ℥vii.
Fiat solutio.
Sig.—Teaspoonful thirty minutes after eating.

All of the grave symptoms now rapidly disappeared, vomiting ceased altogether, appetite returned, and the food was assimilated. The tumor, however, persisted for three

months before it commenced to noticeably decline. I now increased the dose of condurango to a teaspoonful and the iodide to 5 grains; other treatment same as before. Improvement from this time on was rapid. The tumor shrunk away and magically disappeared. Bowels occasionally gave some annoyance during treatment, first with a dogged constipation, succeeded by an obstinate diarrhœa. Little heed was paid to this, however, and in time a normal condition of the bowels was established.

In six months all evidence of her disease had disappeared, and at the present time she is in as good health as at any time in her life. Six weeks ago she was attacked with a remittent fever, which I treated as in any other case, and could discover no trace of her former trouble.

I have thought it of interest to sum up the amount of medicine used in this case, and find that she consumed over five pounds of fluid extract of condurango, four and one-half ounces of iodide of potassium, four and one-half ounces of pure pepsin, and one ounce of cocaine. She took no other medicine besides this, except the strychnine prescription, and left off the treatment without trouble or feeling any necessity or desire for its continuance.

Recovery proves the diagnosis; but, inasmuch as physicians of reputation pronounced the case cancer, I recapitulate the symptoms it presented, under the separate headings of "Gastric Ulcer" and "Gastric Cancer:"

Symptoms indicating ulcer.	Symptoms favoring cancer.
Age.	Previous health of patient.
Ancestral history.	Habits, surroundings, and general conditions.
Recovery.	Inception, progress, and duration.
	Tumor, hemorrhage, vomiting, and its characteristics.
	Absence of HCl in ejected gastric contents.
	Implication of liver, secondarily, and character of pain.

The weight of evidence is in favor of cancer, and in the fact of recovery alone we must rest our decision against such diagnosis. The ancestral history is of little value here,—first, because we have no reliable data; and, secondly, because it is not absolute that there must be an inherited diathesis or cachexia to produce cancer, or that very much the greater number of cases follow such constitutional condition.

The seed cannot evade imparting to the tree or fruit a full ratio of the constituents derived from its parents, and every seed from the same source must do this alike; so if there be that parental morbific state which makes one issue peculiarly susceptible to cancerous growth, it would seem that all progeny would have a like predisposition. Here, however, we are confronted with the fact that, while one member of a family may develop a cancer without appreciable exciting cause, another member of the same family may acquire dyspepsia in its worst form, a mammary tumor, as the result of a traumatism, or other conditions interfering with normal nutrition of parts especially liable to be the seat of cancerous development, and yet do not develop this malignancy.

It is not remarkable, then, that this case should have been diagnosticated cancer; I should unhesitatingly have so pronounced it had I been called upon for an expression of opinion.

The recovery, of course, overtops all other evidence, and teaches us the lesson not to be sure, and to bend the mind with energy and confidence to therapeutics. I am a believer in medicines, without a qualification. Am not satisfied that anything is incurable, not even cancer, and whenever I fail in any case, the only reflection that is absolute with me is that I did not know how to treat it. When I feel differently from this, I will no longer practise medicine.

RHUS TOXICODENDRON.

By Chas. Raymond Carpenter, M.D., Leavenworth, Kansas.

HISTORY repeats itself, as well in the medical profession, it seems, as elsewhere.

The investigations of Dr. Aulde concerning the action of rhus toxicodendron are an illustration of this fact. Prosecuted as they were independently of any previous investigations, he arrives at exactly the same conclusions that were enunciated by another investigator many years ago.

I stumbled upon this fact quite as accidentally as did Dr. Aulde upon the clue which led him to investigate the drug in question.

Upon reading the article of Dr. Aulde, in the October number of the Therapeutic Gazette, I was much impressed with it, and

resolved to give the drug a trial. Not having the facilities for manufacturing the tincture according to his directions from the fresh plant, and it being rather late in the season to gather the plant anyhow, it became a problem to secure a suitable preparation of the drug. It occurred to me, however, that I had heard of the rhus being used by homœopathists for certain inflammatory conditions of the skin simulating the well-known rhus-poisoning. Following up this thought, I remembered also to have heard that the basis of the homœopathic therapy was a system of tinctures, which it was claimed were very concentrated.

Going to my druggist, I asked him if he had any of these tinctures. He replied in the affirmative. I ascertained also that he had the particular tincture for which I was looking. I asked him what the strength of these tinctures was as compared with our standard. He said they were about the proportion of one to four, or about twice the strength of our tinctures, and were manufactured from the green drug.

Here, then, was exactly the preparation I wanted, which could not have been more satisfactory had it been made to order. I used the tincture as thus prepared in three cases:

Case I.—Mrs. B., aged about 60 years; afflicted for many years with chronic rheumatism. By long and careful treatment with all the best remedies so well known to our profession, I had been able to hold the disease in abeyance and make her fairly comfortable, with the exception of one shoulder and arm, in which the excruciating pain would recur in spite of all my efforts; and the patient had finally ceased to expect any marked relief. I diluted the "mother tincture" in such a manner as to make the proportion one to sixteen, and directed her to take 1 drop three times a day, increasing the dose by one drop each day until she arrived at a dose of 5 drops.

After the first dose the pain disappeared, and did not thereafter recur. On taking 5 drops had some abdominal pain, and reduced the dose to 1 drop. No recurrence.

Case II.—Mr. B., husband of the above, a cabinet-maker, aged 70 years; has Bright's disease, for which he has been under treatment, but has also varicose veins, with a large ulcer on the left leg, and twinges of rheumatic pain in the sciatic nerve. Administered the drug in the same manner. Pain disappeared, and I observed that incidentally to the administration of the drug the dropsy was diminished, notably in the upper extremities.

Case III.—Mr. S., grain merchant, aged about 45 years; has been a great sufferer for nine years from neuralgic headaches, traceable to hemorrhoids and a rheumatic diathesis. Prescribed—

℞ Tr. rhus toxicodendron, gtt. iv;
Dilute alcohol, f℥i. M.
Sig.—Teaspoonful three times a day.

After the first dose, which was taken in the middle of the day, on an empty stomach, headache much worse. Probably due to irritation of the stomach, as the dose was much larger than those prescribed in other cases. After dinner he lay down for a while, and then took another dose. Headache left him, and was able to attend to business. Saw him in the evening, after taking the fourth dose, on his own responsibility. Headache still absent, but felt "shaky, as though he had taken large doses of quinine." Ordered the dilution of the medicine to one-fourth the strength, and continued three times a day. Has had no recurrence of the headache for about a week.

Whether the relief in these cases will continue is a matter for the future to decide, but certain it is that great relief has been afforded so far, especially in the first and last cases. And it is my purpose to continue the use of the drug. But one day I happened to meet in a drug-store the leading homœopathic physician of the city, a very intelligent gentleman, and a worthy man in every respect, by the way, and the following colloquy took place:

"Doctor," I asked, "in what conditions do you and the members of your school use rhus toxicodendron?"

"We use it," he replied, without any hesitation, "in certain forms of rheumatism."

"What forms," I asked,—"inflammatory?"

"No," said he, "in the chronic forms, in muscular rheumatism, and in different forms of neuralgia. We use it also in the soreness of the muscles due to overexercise."

Not a word was said about skin-diseases, and, in fact, so taken aback was I that I neglected to ask about that phase of its therapy.

I remarked that I had recently read an article upon the use of rhus in rheumatic affections, and had been trying it.

"Oh, yes," he remarked, with a bland smile; "it is an excellent remedy in those conditions. We have used it for a long

time,—some seventy-five or eighty years, I think. It was introduced by Hahnemann."

[The THERAPEUTIC GAZETTE has published recently certain articles by different authors upon rhus toxicodendron, exceedingly laudatory in regard to its influence in rheumatism. Rheumatism is a disease so inexplicable in its turnings and twistings, in its attacks and retreats, that it is most difficult to judge the action of any remedy upon it. Many years ago, while I was a resident in the Pennsylvania Hospital, propylamine was brought forward as a remedy absolutely dominant over rheumatism, and I well remember that Dr. James J. Levick, my chief, came to the hospital one day, and, laughing, said, "Yesterday I saw in private practice a violent case of inflammatory rheumatism. I ordered the new remedy,—propylamine. To-day the patient seems entirely well. I reasoned to myself, 'This new remedy is certainly a wonderful thing.' But the lady said to me, 'The medicine is so powerful that I never took the cork out of the bottle; its presence in the house was the only thing necessary for a cure.'"

Nearly ten years since I was much impressed with the accounts published in various homœopathic journals of Philadelphia of rhus toxicodendron for rheumatism, and being at the time visiting physician to the Philadelphia Hospital, with a large number of cases of subacute, chronic, and acute rheumatism under my care, I availed myself of the opportunity to test the virtue of the drug. I obtained the homœopathic tincture from a large homœopathic pharmacy. I tried it in all forms and doses, homœopathic, small, and large, and found it exceedingly uncertain in its action and giving no definite good result. I was not able to see that the patients progressed, on the average, any more rapidly when taking it than when left to nature and nursing.—H. C. WOOD.]

DIAGNOSIS OF OVARIAN TUMORS FROM UTERINE FIBROIDS.

At the meeting of the Medical Society of London, held December 2, 1889, DR. LEWERS read a paper on the "Diagnosis of Ovarian Tumors from Uterine Fibroids" (*Lancet*, December 7, 1889). It was more particularly the diagnosis of solid, or semi-solid, ovarian tumors that was considered in the paper. Dr. Lewers read notes of a case of ovarian tumor of this kind, and showed the specimen (a large tumor, about the size of the pregnant uterus at the eighth month). Before the patient came under his observation the tumor had been regarded as a uterine fibroid, and treated by electricity according to Apostoli's method, fortunately without puncture. Careful examination, however, convinced Dr. Lewers that the case was one of ovarian tumor. He accordingly operated in the usual way, and found that it was so. The patient made a good recovery. The points which seemed to be most important in making the diagnosis were: First, as regards the history, the fact that symptoms had only been present for eight or nine months, whereas so large a tumor, had it been a fibroid of the uterus, would probably have caused trouble for a much longer time. Second, as regards the physical signs, the absence of any marked degree of anæmia, although the patient gave a history of menorrhagia; the losses could not, therefore, have been very great, as they would almost certainly have been if this large tumor had been a soft fibroid of the uterus. Again, on vaginal examination the vaginal portion of the cervix projected in the usual way, not being displaced or deformed, as it so often was in cases of uterine fibroid. Tilting the vaginal portion of the cervix gave the impression that the uterus was not enlarged, and that there was no such close connection between the uterus and the tumor as there would have been if this had been a uterine fibroid. Further, with the sound, which only passed three inches in the uterus, no alteration in its position seemed to be produced by an assistant raising the abdominal tumor as much as possible from the pelvis. Although the general characters of the tumor were those of a solid tumor, it had, nevertheless, a distinct softness and elasticity in parts. There was, therefore, a strong probability against the tumor being a subperitoneal fibroid, which was almost invariably typically hard. Dr. Lewers said that it was only by careful consideration of all these points that a correct diagnosis could be made in difficult cases. An ovarian tumor was usually to be regarded as having a malignant tendency in direct proportion to the amount of solid tissue entering into its composition. If ovarian tumors with this tendency were mistaken for uterine fibroids, valuable time would be lost, and it might very likely be too late to remove the tumor completely when the progress of the case had at length made the diagnosis clear.

The Therapeutic Gazette

EDITED BY

ROBERT MEADE SMITH, A.M., M.D.,
Professor of Comparative Physiology, University of Pennsylvania,

PHILADELPHIA.

GEO. S. DAVIS,
Medical Publisher, Box 470,
DETROIT, MICH.

Philadelphia, 714 Filbert Street.

SUBSCRIPTION RATES FOR 1890.
(Journal increased to 72 pages.)

THERAPEUTIC GAZETTE (postage included).....$2.00
THERAPEUTIC GAZETTE with MEDICAL AGE..... 2.50
THERAPEUTIC GAZETTE with AMERICAN LANCET 3 25
THERAPEUTIC GAZETTE with AGE and LANCET... 4.00

Foreign subscriptions may be ordered through our agent in England, Mr. H. K. Lewis, Medical Publisher and Bookseller, 136 Gower Street, London. Price 10s. Remittances may be made either by Postal Order or Stamps.

Price to Foreign Subscribers direct (postage included), $2.50 (10 shillings). English postage stamps received on remittances.

Editorial communications should be addressed 332 South Twenty-first Street, Philadelphia. Articles intended for the Original Department of the GAZETTE will be accepted only with the understanding that they are contributed to it exclusively.

Business communications should be addressed to the Publishers.

Leading Articles.

COCILLAÑA AS AN EXPECTORANT.

FUTURE historians will undoubtedly describe the times we live in as the age of hypnotics. It is only necessary to mention a compound of any character as probably possessing hypnotic properties to lead at once to the publication of enthusiastic reports on all sides as to the unprecedented success which follows the employment of the new hypnotic.

The life of such articles, however, is but brief, and we have only to look to the record of the substances introduced in the last few years as hypnotics to determine the general value of such material. Of the many which have been recommended as invaluable, but two or three preserve the confidence of the profession; and, while every one is so willing to investigate, or even to accept without investigation, any statement as to the properties and character of the hypnotic, no other drug seems capable of claiming the slightest attention.

In the THERAPEUTIC GAZETTE for August, 1888, we published an article by Dr. H. H. Rusby, describing a drug which he had discovered to be in common use in Bolivia, and which appeared to possess marked emetic, cathartic, and expectorant properties, so as to render it apparently equal in importance and similar in properties to ipecac. From that time to this, as far as we can determine, cocillaña has been employed, or, at least, results as to its use have been published, by but three different observers. In the THERAPEUTIC GAZETTE for January, 1889, Dr. S. F. Landry published a short note on a single case in which cocillaña had acted as a cathartic. In the GAZETTE for November, 1889, we published an abstract of a paper by Dr. David H. Stewart, who claimed that he had obtained the most satisfactory results from the use of cocillaña in bronchial catarrh, where he stated, from the analysis of forty cases, that this drug possessed the power of reducing cough, while facilitating the removal of bronchial secretions. The results in chronic bronchitis were especially satisfactory.

The literature on cocillaña is, we believe, completed up to the present time by the publication of an address on cocillaña, delivered by Dr. R. W. Wilcox before the New York Academy of Medicine on December 17, 1889 (*Boston Medical and Surgical Journal*, January 2, 1890).

Dr. Wilcox, in his experiments, employed the concentrated tincture, though he adds that he believes the fluid extract, in doses of from 5 to 25 minims, would be preferable, on account of the absence of alcohol.

The dose of the concentrated tincture of the bark used varied from ½ to 2 fluid-drachms, given every two to eight hours. Having made a comparison of the effects of the drug with those of apomorphine in acute bronchitis, he related a number of cases in which cocillaña was used, and went on to say that it was probably in subacute and chronic dry bronchitis that the larger field for its employment would be found. The facts that its expectorant effect was more sure than either apomorphine or ipecacuanha in liquefying bronchial mucus, that it increased the appetite, and that it acted, to some extent, as a laxative, all rendered it a most useful remedy. On the other hand, in senile bronchitis, particularly in cases of calcified costal cartilage, it might so markedly add to the bronchorrhœa as to become absolutely dangerous, and especially because it was not a stimulant to the respiratory centre, like belladonna and strychnine. In these cases, then, it was useful only so far as it liquefied secretion.

Dr. Wilcox then related another series of cases, and remarked that in chronic pulmonary disease it could be seen that cocillaña had almost its only use in liquefying secretion and relieving the acute exacerbations of associated chronic bronchitis. Under its use the cough and expectoration diminished, and the night-sweats, constipation, and lack of appetite were relieved. Naturally, when cough was due to pleuritic exudation, or was laryngeal or pharyngeal in character, cocillaña, like all other expectorants, would fail.

In conclusion, he stated that he believed cocillaña to be superior to apomorphine, except in cases of acute bronchitis taken in hand within the first forty-eight hours. It was certainly preferable to ipecacuanha, in that it did not so readily cause nausea and metallic taste in the mouth, and, moreover, assisted regular movement of the bowels. It was immeasurably safer in any stage of acute bronchitis than pilocarpine, because it did not depress the heart's action; though it must yield to carbonate of ammonium in chronic senile bronchitis. On the whole, he thought it could fully replace ipecacuanha in every sphere of action, and that in many cases it could be substituted with advantage for apomorphine, carbonate of ammonium, strychnine, and other drugs classed with more or less reason as expectorants.

Dr. Rusby (*New York Medical Journal*, January 11, 1890), who was present at this meeting, added to Dr. Wilcox's statements as to the value of this remedy. Dr. Rusby found in his experience that the drug gives its best action when its administration was somewhat forced. Thus, in the first stages of bronchitis, 15 minims, repeated at intervals of from two to three hours, was of great benefit. This would result in the production of a profuse mucous discharge, with a tendency towards the return of the mucous membrane to its normal condition and the abortion of the attack. If, however, such a favorable result was not produced, the administration of the medicine should no longer be continued in this manner. We must, then, look forward to a more prolonged treatment, and doses of from 15 to 25 minims should be given only at intervals of three or four hours. One of its most important offices he believed to be that of promoting the appetite. This was among its earliest and most marked effects, and he believed that its use in smaller doses—of say from 10 to 15 minims, an hour before meals—was plainly indicated independently for this purpose. Dr. Wilcox's paper, he thought, was specially valuable, inasmuch as it indicated a reason not only for the failure of the drug in certain cases, but for the unquestioned fact that in the hands of several experimenters it had produced harmful results in certain cases. Dr. Wilcox had explained this by showing that, while cocillaña possessed the power of increasing the discharge and its fluidity, it did not possess the power of stimulating the organs to throw off this discharge; so that its use was dangerous in cases where there was great impairment of this power.

It is greatly to be regretted that this drug, which promises to be so valuable, and to be such a satisfactory substitute for ipecac, has not been subjected to more thorough study. In Dr. Rusby's first paper he alluded to some results obtained in chemical examination of this drug, which appeared to show that it contained an alkaloid, a conclusion which is apparently substantiated by its properties, and which point to some principle which is allied to or identical with emetine. We trust that this drug will receive the study which it appears to merit, that its proper place may be fixed with certainty.

THE HYPNOTIC ACTION OF CHLORALAMIDE.

IN the *Centralblatt für Nervenheilkunde, Psychiatrie und Gerichtliche Psychopathologie*, No. 22, 1889, Dr. Karl Schaffer adds his experience to the accounts already published on the use of chloralamide as an hypnotic.

In fifteen cases of progressive paralysis, he found that it produced satisfactory sleep where simply insomnia was complained of. Where there was a slight degree of excitement, in doses of 60 to 75 grains it produced a quieting effect, though where the excitement was more marked it produced no effect, and failed in doses of 60 grains, where 45 grains of chloral were perfectly efficacious.

In five cases of mania its action was unsatisfactory when administered in doses of 75 grains, as was also the case in five cases of insanity accompanied by hallucinations. In fact, the analysis of Dr. Schaffer's cases seems to show great uncertainty in the results obtained. In some cases small doses would produce sleep, and in others large doses would be ineffective, while whenever there was any marked excitement or pain it was nearly always inert. Further, he has found that, in doses of 30 grains, the patients

complained of severe headache; loss of appetite and nausea are sometimes produced, while chilliness and hebetude were in several cases complained of on the following day. In no case did it ever prove active where the insomnia was accompanied by or attributable to pain.

In the *Zeitschrift für Therapie* for December 15, 1889, Drs. A. Robinson and Fürbringer publish certain facts in reference to the action of chloralamide, which still further detract from the reputation previously possessed by this new claimant for hypnotic honors.

The results of these authors were obtained from the administration of chloralamide, as well as somnal, to fifty different persons in one hundred and twenty different doses, and the results indicate that in fifteen instances the effects produced by somnal were good, in thirteen moderate, in twenty-two absolutely negative; while in the case of chloralamide in thirteen instances the results were satisfactory, in fourteen it was but moderate, while in twenty-three cases it was negative in producing sleep; consequently somnal failed of the desired result in forty-four per cent. of the cases, chloralamide in forty-six per cent. When next it was used as an hypnotic, to reduce or overcome pain, the percentage of successful cases was much smaller, being only fifteen per cent. in favor of somnal and but ten per cent. in the case of chloralamide. So that, therefore, even the most sanguine believers in these drugs can only claim them to be hypnotics, and not narcotics, and, if we claim that a good hypnotic should possess certainty, promptitude, and freedom from unfavorable after-effects, neither chloralamide nor somnal can claim admission into this list of drugs.

Readers of the GAZETTE will remember that one of the chief claims in favor of chloralamide is its freedom from action on the circulation. Fürbringer, however, claims that the results in his hands have been directly opposed to this statement, and he reports five cases in which the disturbing action of chloralamide upon the circulation was more marked than was the case in equivalent doses of chloral, even when smaller doses than 30 grains were employed, though, to be sure, no action upon the circulation was present, yet there was not the slightest relief of the insomnia. In the case of somnal, the action on the circulation was less marked: only in a few instances did it produce a slight slowing of the pulse. The authors even contradict the statements of their predecessors as to the freedom from action of chloralamide on the digestive functions, and refer to fourteen instances in which it produced marked gastric disturbances, and, in the case of somnal, violent vomiting in two instances, so as to lead to the discharge of bile from the stomach. Chloralamide, in doses of 30 grains, never produced vomiting, but in four cases there was marked nausea, and larger doses in nearly every instance produced emesis. In at least the majority of the cases in which these two drugs were used there was complaint the next day of more or less marked dizziness, depression, and headache. In fact, many of the patients stated that they would rather suffer from insomnia than receive either of these drugs again. Both of the drugs were employed as hypnotics in typhoid fever. In the case of somnal, 15 grains had no effect, 30 grains in one-third of the cases produced sleep without change in the activity of the heart, while 45 grains made the patients even more restless, and led them to complain on the next day of vomiting and headache, although there was no modification in the pulse. In the case of chloralamide, on account of the fear of its action on the pulse, the dose first used was only 15 grains, which was without any action whatever. 22½ grains produced considerable excitement and increase of the pulse, and, when the dose was increased to 30 grains, the pulse was greatly increased in rapidity, and became in one case so weak that camphor and other stimulants had to be administered; while, further, some of the patients were so restless that they had actually to be held in bed. The most favorable action of chloralamide was in cases of marked excitement, where five successes were obtained out of eight, but even this success was so moderate that the high percentage of failures and the unfavorable after-symptoms which accompanied the use of these hypnotics are strong arguments in the authors' minds against the substitution of either of these remedies for the old well-known hypnotics.

Finally, Dr. Halasz, in the *Centralblatt für die Gesammte Therapie* for December 5, 1889, states that experiments upon dogs fail to show that chloralamide produces any unfavorable after-effect upon the circulation or digestion, while his clinical results show that, while chloralamide did good, it was by no means an absolutely certain hypnotic, and will but rarely succeed where insomnia is due to pain. He also has found that chloral-

amide is not free from disagreeable after-effects, and will in many cases produce headache, dizziness, depression, and dryness of the throat. He, nevertheless, failed to find any severe disturbance in any case, and avers that it is free from cumulative action, and that patients do not become accustomed to its use.

In the *Therapeutische Monatshefte* for January, 1890, Dr. Langgaard confirms the necessity for caution, to which he was the first to allude, as to the employment of chloralamide as an hypnotic in cases of heart-disease, since he has found through experiments on animals that this substance produces decided reduction in blood pressure and interferes with respiratory activity. In the latter respect Von Mering and Zuntz were unable to confirm his statements, although they likewise found that in other respects experiments on animals confirmed Dr. Langgaard's clinical experience. Von Mering and Zuntz (*Therapeutische Monatshefte*, December, 1889), further, are inclined to think that Dr. Langgaard has exaggerated the depressing influence which chloralamide exercises upon the circulation; but reference to Langgaard's experiments, where blood pressure was reduced from 110 m.m. to 53 m.m., certainly shows that the action on the circulatory organs of chloralamide is by no means insignificant.

Chloralamide and somnal are thus falling into line with the other new hypnotics,—at first extravagantly praised, and then used indiscriminately, until successive failures and disasters show the need of caution in their use and help to establish their true field of usefulness. Chloralamide has not yet, we believe, proved fatal, a difference from sulphonal which, we trust, it will maintain.

THE DIURETIC ACTION OF THEOBROMINE.

WE have in pilocarpine for a long time possessed a substance which is capable of producing marked secretion by the salivary and sweat glands through direct glandular action, but until Von Schroeder recognized that caffeine and theobromine, two substances closely allied in chemical nature, were capable of increasing renal secretion, a pure renal diuretic was almost unknown. The action of this substance is, however, different from that of pilocarpine; for while the latter acts on the secretory nerves of the salivary and sweat glands, in the case of the kidneys the secretion is apparently due to direct action on the renal cells. The action of caffeine in this respect is a peculiar one. In the first place, it acts as a stimulant to the vaso-motor centre and the central nervous system, and is to this extent comparable to strychnine; by the vascular constriction thus produced it reduces the renal secretion. A secondary effect, however, is that the caffeine acts as a stimulant to the renal secretory cells, and so leads to an increased flow of urine. It thus seems to possess two separate types of action which are directly contradictory, a fact which has led to the contradictory and uncertain results which have in so many cases followed the employment of this remedy as a diuretic. Von Schroeder has shown that if the stimulation of the vaso-motor centre be prevented by the simultaneous administration of chloral, or, better and safer, by the use of paraldehyde, that caffeine is then a pure diuretic, although it must be admitted that the large doses of the narcotic which are required for this effect are not free from danger. The most important result obtained by Von Schroeder is, however, found in the fact that theobromine, which, in comparison to caffeine, is almost innocuous, while free from action upon the central nervous system, is a more powerful stimulant to the epithelial cells than caffeine.

In this state of the question it is evident that clinical experiments to determine the value of theobromine as a diuretic are highly desirable, and we, therefore, regard as extremely important the results published by Dr. Gram in the *Therapeutische Monatshefte* for January, 1890. In the experiments made with a compound of caffeine and paraldehyde, Dr. Gram states that he invariably found that a marked diuretic action was produced, so that his clinical experiments are, therefore, in accord with the physiological investigations of Von Schroeder. In spite of this, however, it does not appear that this combination is suitable for therapeutic employment, for the use of paraldehyde entails so many unpleasant symptoms, such as loss of appetite, bad taste in mouth, etc., and, in fact, may even be dangerous to the patient. In his experiments with theobromine he was at the outset met by the difficulty of its great insolubility, and by the fact that it exerted a great tendency to the production of emesis. After a number of experiments, he found, however, that the administration of theobromine in coffee or chocolate served to overcome part of these

advantages, yet the action as a diuretic was by no means constant, a fact which he attributes to the slow absorption of the theobromine.

After a number of experiments with the salts of theobromine, he finally succeeded in finding a combination of theobromine with salicylate of sodium, a compound which corresponds to one of the so-called soluble double salts of caffeine. While the theobromine is only soluble in about 1000 parts of water, sodio-salicylate of theobromine, or, as he calls it, "diuretin," is soluble in less than one-half its own weight of water, on warming slightly, and remains in solution after cooling. This compound occurs as a white powder, containing fifty per cent. of theobromine, and may be administered to the extent of about ninety grains daily in 15-grain doses. It is stated that this substance may be given even to patients with serious heart affections without even producing nausea or vomiting. Dr. Gram reports detailed notes of eight different cases in which theobromine was used as a diuretic; from these he concludes that although the pure theobromine is absorbed with difficulty, after its absorption it acts as a marked diuretic without any influence on the heart. It is, therefore, a direct renal diuretic. Sodio-salicylate of theobromine, on the other hand, is readily absorbed; it acts as a powerful diuretic, and it has never produced the slightest unfavorable symptom. Dr. Gram does not believe that the diuresis is at all attributable to the sodio-salicylate, for he has in many cases employed the latter without finding the slightest diuretic effect produced.

Of course it is not to be expected that we have in theobromine a specific for dropsy, but when we recognize that nearly all the cases in which Dr. Gram employed this substance were cases in which the ordinary diuretic remedies, such as heart stimulants, had not produced the slightest relief, it is evident that theobromine acquires especial value. Of course, in cases where there is extreme degeneration of the renal epithelium, a diuretic effect is not to be expected.

EUPHRASIA OFFICINALIS AND THE TREATMENT OF CORYZA.

IT has often been said that a fortune awaits the doctor who can cure a cold; of course presupposing that the new treatment be free from the usual reproach that the remedy is worse than the disease, and that the inventor has, what we might term, a well-developed commercial spirit. We believe fully that the old days of the nauseous Dover's powder, etc., have, in this connection, at least, passed away; not that they were not useful, but that a better effect may be so much better produced, and with less discomfort to the patient.

We think that it will be found that an attack of coryza, if taken in the early stage, may nearly always be aborted by the use of a spray of a four per cent. solution of cocaine, or by the use of a snuff of bismuth, acacia, morphine, and cocaine; at any rate, in reducing the engorgement of the Schneiderian membrane, cocaine will produce and maintain relief from the most distressing symptom, while fever, if marked enough to be noteworthy, may be relieved by the antipyretics or by a drop or two of tincture of aconite. In the great majority of cases some such simple treatment as this will suffice. Every new remedy for "a cold in the head," nevertheless, deserves attention, and the most recent of these is *Euphrasia officinalis*.

Euphrasia officinalis, or eyebright, a small annual plant, common to Europe and the United States, without odor, of a bitterish, astringent taste, once enjoyed considerable popularity as a remedy for eye affections, especially in ophthalmia, but has lately almost become obsolete. In the *Boston Medical and Surgical Journal*, November 7, 1889, Dr. G. M. Garland publishes four cases of coryza in which various remedies had failed to produce any relief, but in which tincture of euphrasia, in doses of 10 drops, produced surprising relief. It seemed to have been especially efficacious in aborting coryza: when administered at the very onset of the attack, it is claimed to entirely arrest the flow of the mucus from the nose; in later stages, when the nasal discharges had advanced to a purulent or muco purulent condition, he has had no success with it. In addition, Dr. Garland writes that he has had surprising success in the treatment of infants with *Euphrasia officinalis*. A few drops of the tincture in a little water, given to a child *ad libitum*, will give prompt relief without disturbing the digestion; as it has an aromatic taste and pleasant odor, it is readily taken.

Dr. Beverley Robinson, on the other hand, in writing for the *Boston Medical and Surgical Journal*, states that he has been familiar with the use of *Euphrasia officinalis* for a number of years as a medicine which has been stated to possess the power of

aborting an attack of acute coryza. Dr. Robinson, however, believes that it has no more influence than that of many other drugs, and in his opinion seems not to be comparable to the carbonate of ammonia in frequently repeated and tolerably large doses. In fact, Dr. Robinson claims that his experience with *Euphrasia officinalis* is in accordance with that of a large number of other physicians, both of the regular school and of the homœopaths, and that nearly all have given up this drug because of it being practically inert.

In this connection we may mention that Dr. S. Wilson Hope, in the *British Medical Journal* for November 9, 1889, claims that 20 grains of salicylic acid, given in liq. ammon. acet., three or four times a day, will so far control a common cold, that the aching of the brow, eyelids, etc., will cease in a few hours, as well as the sneezing and running from the nose, and, more fortunate still, the cold will pass off, and not finish up, as is customary, with a cough.

In another column we refer to the use of inhalations of menthol in aborting coryza.

ON SCOPOLIA CARNIOLICA—A NEW SOURCE OF HYOSCYAMINE.

ABOUT a year ago a rhizome appeared upon the market as a substitute for the root of *Atropa belladonna*, under the name of *Belladonna scopolia*. It was imported from Germany, where it was said to grow wild, and the juice was claimed to possess mydriatic properties. Two species of scopolia have already been the subject of chemical investigation, though the new rhizome is not likely to be derived from either of these plants,—the *Scopolia japonica* and *Scopolina Hladnikiana*,—since the first is indigenous to Japan, and does not grow in Europe, and the second is practically unknown outside of the botanical gardens.

This plant, which has been identified as the *Scopolia Carniolica*, has been subjected to exhaustive chemical, pharmaceutical, and clinical study by committees appointed by the Pharmaceutical Society of Great Britain, and their results are announced in the *Pharmaceutical Journal and Transactions* for December 14, 1889. The chemical constituents of the rhizome were investigated by Professor W. R. Dunstan and Mr. A. E. Chaston, who found that the rhizome contains .5 per cent. of hyoscyamine in an almost absolutely pure condition. With the possible exception of a mere trace of hyoscine, no other mydriatic alkaloid was found in the plant, which would seem by this circumstance to be distinguished from other plants belonging to the same natural order,—viz., belladonna, hyoscyamus, stramonium, etc.,—in which different proportions of atropine or hyoscine are present in addition to hyoscyamine. Professor Dunstan points out, however, that this difference may possibly be due to the methods employed by previous workers in extracting the alkaloids from these plants, which may have led to the decomposition of the hyoscyamine by heat or by fixed alkalies. Among the other compounds isolated from the new drug were a crystalline sugar resembling dextrose, a fluorescent substance, and cholesterin. The latter substance is present to the extent of .1 per cent., and it was subsequently found to be contained in the root of *Atropa belladonna*. The resemblance between the two plants is borne out by a comparison of the structures of the roots, which has been made by Mr. Greenish.

Dr. Lauder Brunton undertook to try the therapeutic effects of the drug, but was compelled to abandon his work before the experiments were completed; but, as far as his results go, and those of Sir Dyce Duckworth, who carried on also an independent series of experiments with this drug, they seem to show that the preparations made from this rhizome possess properties similar to, yet not identical with, those of belladonna; apparently with the advantage in favor of the scopolia. It does not give rise to the dryness of the throat which is produced by belladonna, and it did not in cases where it was used internally produce dilatation of the pupil. The use of the liniment was likewise very efficacious in reducing pain and swelling in rheumatism. No atropine was found in this rhizome, although it is, in fact, a matter of doubt as to whether atropine is actually present even in belladonna, or, indeed, in any plant; for in the presence of an alkali it is generally maintained that hyoscyamine and hyoscine readily are converted into atropine, and it is by many believed that the natural state of the alkaloid in *Atropa belladonna* is that it is hyoscyamine, and that it is in some way converted into atropine. For Professor Schmidt (*Pharm. Zeitung*, September 25, 1889) has found that atropine is absent from belladonna-roots obtained from plants of over a year's growth, whether examined fresh or

after prolonged drying, hyoscyamine being the only alkaloid present; while in younger roots atropine and hyoscyamine are both said to be present. Professor Schmidt also reports that he has found both hyoscyamine and hyoscine in the *Scopolia japonica*. It is thus seen there is considerable obscurity attached to the chemical nature of the alkaloids of this natural order,—namely, stramonium, belladonna, etc.

The results of the authors above alluded to are, however, especially valuable, as indicating a cheap source of hyoscyamine, and of furnishing a drug which, in all its properties, appears to be closely identical with *Atropa belladonna*.

Reports on Therapeutic Progress.

THE NEW HYPNOTICS.

At the last annual meeting of the British Medical Association, in the discussion of the action of the newer hypnotics, DR. JOHN GORDON read a paper based on the results attained from his physiological and clinical studies as to the use of urethan as a hypnotic (*British Medical Journal*, November 2, 1889).

Urethan is the ethylic ether of carbaminic acid, and its formula is $C_3H_7NO_2$. It occurs in transparent crystals, which have a cool, saline, and somewhat bitter taste. It is readily soluble in hot or cold water, is also soluble in its own bulk of rectified spirit, but slightly less soluble in ether. Its ready solubility in water, as well as its non-irritant nature, allow of its being employed hypodermically as well as by the mouth.

A series of experiments were performed on frogs to observe the action of the drug on the reflex functions of the spinal cord. The method employed was to decerebrate a frog, to wait till the shock of this operation had so far passed off, to ligate the iliac artery and vein of one limb, to suspend the frog by the head, allowing the hind limbs to depend, to immerse the hind limbs alternately or together in a solution of sulphuric acid (1 in 600), to record by a metronome the time of movement or withdrawal from the acid solution, and to well wash in water the limbs after each withdrawal. When the moment of withdrawal or movement was almost the same in both limbs, to inject below skin of thorax the dose of urethan dissolved in salt solution (.75 in 100), and to proceed with the immersion as before. The result of a large number of the experiments showed that a longer period of time elapsed between the application of the stimulus and the reflex action. The urethan thus diminishes the excitability of the spinal cord.

That urethan had an action on the peripheral endings of the sensory nerves was shown by the elongation of the period at which the unligated limb was moved or withdrawn from the stimulus; and also, in some cases, by its rapid abolition of all movements in the unligated limb. It was further observed that sometimes frogs, in which reflex action had been quite abolished by .5 decigramme of urethan, recovered their reflex in twenty-four hours, and even in forty-eight hours, when kept carefully moistened with a three-fourths per cent. salt solution. The great majority of frogs died shortly after the administration of this dose of urethan.

Dr. Gordon was likewise able to confirm in his experiments the statement of M. Coze, that since urethan diminishes the excitability of the spinal cord, it is antagonistic to strychnine, and may, therefore, be used with value in conditions attended with convulsions, and more especially in cases of tetanus. His experiments on blood-pressure and respiration indicated that the most marked feature of the influence of this drug is in slowing the respiration, a reduction being produced after each injection of urethan. There was also a general tendency to slowing of the pulse and a gradual reduction of blood-pressure, but after division of the vagi the pulse rose within two minutes to its original rate, and the blood-pressure to within two millimetres of its original rate. This seems to point to an action being exerted by the drug upon the central nervous system; in all probability on the vagus roots. The acceleration of the pulse and the elevation of the blood-pressure are more than could have been anticipated under the circumstances, as a result of vagus tonus, provided that no stimulation of the central vagus apparatus had been present. His experiments to determine the amount of urethan producing irritation showed that the nerve-trunk was not markedly affected by the smaller doses (two per cent. solutions), but when treated with stronger doses (four per cent. solutions) the nerve-trunk speedily lost its conductivity, which it did not recover by a subsequent washing in salt solutions (three-fourths per cent.). On the muscles Dr. Gordon found that the result of a series of ex-

periments on this part of the subject showed that two per cent. solutions of urethan in salt solution abolished the normal tetanic curve, which, on further stimulation at definite periods, became still weaker, and finally failed to respond to faradic stimulation. If the muscles at this point were well washed in salt solution, and immersed in it for five to ten minutes, and stimulation again applied, the irritability of the muscle was found to have been so far recovered; subsequent washings and immersions still further tending to restore the irritability; and that this irritability of the muscle substance was speedily abolished, as shown by the slowing and abolition of the normal tetanic curve; and that the muscle, although immediately washed at this point in salt solution, showed only slight tendency to recover its irritability.

The action of urethan on muscle substance is much like that of paraldehyde. Both drugs in weak solutions temporarily abolish the irritability of muscle substance; both allow of considerable recovery of the irritability when the poisoned muscle is speedily washed with salt solution; and with strong solutions, urethan, like paraldehyde, tends to destroy the irritability of muscle, so that washing in salt solutions only feebly recovers it. Also with strong solutions both drugs tend to cause the muscle to pass into rigor. Urethan, however, does not show any initial rise of irritability in the muscle when applied in weak solutions, as paraldehyde often does.

Dr. Gordon's clinical experiments were made upon boys recovering from minor surgical ailments. They were placed on a selected mixed diet of their own choice, the fluids of which were carefully measured and the solids accurately weighed. This regulated diet was steadily continued during the time of the observations. The dose, which was given dissolved in cold water, was given in the morning at nine o'clock. It was thought that by choosing this hour its action as a hypnotic could be better observed, as the subject, presumably having had a good night's rest, would be less inclined to sleep. After the administration the patient was kept quiet in bed. The following summary affords the results of his observations, both clinical and experimental:

1. It reduced the excitability of the reflex action of the spinal cord.

2. It diminished peripheral sensation.

3. Pharmacological and clinical observations showed that it slowed the respirations.

4. It also slowed the pulse.

5. It lessened the blood-pressure immediately after its injection, but the blood-pressure had a distinct tendency to recover soon after the injection, and finally rose to near its initial height.

6. It had an anæsthetic action as a sequel to the administration of ether.

7. Small doses (two per cent. in salt solution) did not markedly affect the motor nerve-trunk.

8. Large doses (four per cent. in salt solution) quickly destroyed the conductivity of motor nerves, and subsequent washings did not recover it.

9. In frogs poisoned with urethan, the minimal irritability of nerve was still greater than that of muscle, and subsequent washings in salt solution increased the irritability of the muscle, but did not alter that of the nerves.

10. That small doses (two per cent. dissolved in salt solution) abolished the irritability of muscle, but that washing in salt solution so far restored the irritability.

11. That large doses (four per cent. in salt solution) almost entirely destroyed the irritability of muscle, and that subsequent washings in salt solution only slightly (and in many cases not at all) tended to restore the irritability.

12. That small doses (5 to 10 grains) increased the excretion of urea.

13. That large doses diminished the excretion of urea.

14. That the fluid constituents of urine were slightly increased while it was administered.

15. In one case the urine was slightly alkaline after doses of 20 and 40 grains.

16. That the skin with large doses showed a tendency to perspiration and flushing.

17. That it had no effect on temperature.

18. That no hypnotic effect was produced in good health, even in large doses.

19. That its prolonged exhibition tended to cause loss of appetite, and that vomiting occasionally followed its continued administration.

20. That in cases of insomnia it was somewhat unreliable.

21. That the sleep which followed its administration was tranquil, pleasant, and natural.

22. That no confused feelings were experienced when the patient was awakened during the action of the drug.

23. That it was not contraindicated in cases in which a slight degree of pain was present.

At the same meeting Dr. T. Cranstoun

CHARLES stated that he had found paraldehyde to be a most excellent hypnotic. It acted promptly and safely, was not cumulative in its action, and did not readily lose its effects; it appeared also to strengthen the heart's action, and to diminish the frequency of the pulse. The only objections to its use were its disagreeable and nauseous taste, and the odor it imparted to the breath. He had never noticed the hæmoglobinuria which had been stated occasionally to occur under its use. To one patient of his it had been given for the last seven months with the greatest advantage; he had also taken it himself with most beneficial results. Rarely had its action been followed by headache or digestive disturbance of any kind. Whiskey had served as a very good vehicle. To students who had been afflicted with general wakefulness during examination time it had proved of great service; and two students who obtained distinguished places in the recent Indian Civil Service examinations, and who had become almost sleepless, used it with the greatest advantage during the greater part of the time these examinations lasted.

As to hypnone, although when it produced sleep this was deep and lasting, yet it failed so often in his hands that he had given up administering it. Besides, it was nasty to take, may irritate the stomach, and imparts a bad odor to the breath. In some cases of simple insomnia, however, it acted fairly well, and gave very good results in some phthisical patients.

The action of amylene hydrate gave great satisfaction, sleep generally being produced rapidly, and lasting six to twelve hours. Burgundy and sugar were good vehicles. The respiratory and cardiac activities were not affected, neither was the digestion. It acted well when combined with morphine for the relief of sleeplessness associated with pain. In cases of sleeplessness with delirium tremens, melancholia, and phthisis, it was very useful; indeed, it sometimes appeared superior to paraldehyde, which it excelled, in that its taste was not so repulsive nor the odor imparted to the breath so unpleasant. There was rarely any disturbance of the appetite or bowels produced, and in a case of fatty heart, in which urethan had entirely failed, it succeeded admirably. It slightly diminished the reflexes, slowed the heart, lessened the blood-pressure, quickened the respiration, and in one or two cases lowered the temperature. On the whole, therefore, Dr. Charles had found it most satisfactory as a hypnotic.

Urethan, on the other hand, frequently disappointed in its action. In addition to its want of energy in many cases, it frequently brought about gastric disturbances. In himself light and imperfect sleep was produced by 45-grain doses in about twelve to fifteen minutes after a short stage of slight excitement, lasted six hours and a half on an average, produced no headache, and the presence of the drug could, after waking, be detected in the urine. In cases of delirium tremens it was of no value, but was fairly useful in the sleeplessness of children and in some cases of melancholia.

Methylal acted efficiently in a few cases of sleeplessness, with gastric or intestinal irritation. The blood-pressure was slightly lowered, and the respiration slowed.

Hydrate of butyl chloral had proved most serviceable in his hands in a case of Bright's disease, with hypertrophied heart, in which chloral had produced alarming results. No depressing action on the heart apparently occurred under its action. It was particularly useful in the sleeplessness associated with headaches, tic, facial neuralgia, and certain uterine derangements. Combined with sodic or potassic bromide and cannabis indica, it occasionally gave splendid effects, particularly where the insomnia was attended with high arterial tension.

Sulphonal, however, was the hypnotic Dr. Charles had been using most frequently of late, and with the best results. The sleep was produced slowly, as a general rule, sometimes very many hours even elapsing before any hypnotic action was manifested; but the sleep was both light and refreshing, and no deleterious effects were produced on the circulation; the arterial pressure was slightly lowered, though in three cases a subsequent slight rise was noticed; indeed, the only bad after-effects appeared, as a rule, to result solely in cases where the dose had been too small. In one case alone, that of a nervous girl, aged 16, had he observed any serious after-effects,—headache, hysterical attacks, some hyperæsthesia, with thickness of speech, giddiness, and temporary loss of power in the muscles of the legs showing themselves. In the sleeplessness of phthisis it acted well; in simple insomnia, in the insomnia of Bright's disease, in that accompanying intercostal neuralgia and delirium tremens, and in a case of mania where chloral and paraldehyde had failed, in all it gave the fullest satisfaction.

In a case of epilepsy, with motor spasms

and sleeplessness, and in the case of a betting man after races in which he had lost heavily, and where there was delirium with great excitement, subcutaneous injections of hyoscine ($\frac{1}{100}$ grain) rapidly produced deep sleep, preceded by a short stage of stupor.

In a few cases—nervous palpitation, hysteria, urogenital excitement—much benefit had also been gained from monobromated camphor; while in the sleeplessness of business-men a late supper of beer and salad, sometimes the slow sipping of beer containing lactic acid, the administration of strychnine in small doses, the bathing of the feet in hot water and of the head in cold water, or the application of a hot-water bag to the abdomen, often induced the wished for sleep most happily and effectually.

Dr. Needham (Gloucester) considered urethan to be of very small use, a very mild hypnotic and very uncertain; sulphonal to have the disadvantage of being uncertain in its action, insoluble, and extremely liable to produce derangement of the digestive organs. He regarded paraldehyde as one of the most valuable hypnotics in use, generally certain in its action, causing no constipation, no loss of appetite, no decrease of weight. The dose should be fairly large—not less than a drachm—and should be repeated. It calmed excitement and produced sleep, and expedited the recovery of patients in incipient cases of insanity, and from an acute insanity in its more advanced stages. The taste was covered largely by fluid extract of licorice. If long continued, it was liable to cause irritation of the mucous coat of the stomach.

Mr. J. P. Richards (Hanwell) had found urethan practically useless, and had never found it act as a sleep-producer in the insane. On the other hand, paraldehyde had had a most marked hypnotic action in cases of acute or delirious mania, but even in these he had found that the dose had to be a large one in the first instance, and repeated by a smaller one at a short interval. In many cases of delirious mania he had tried in vain the usual hypnotics; sleep would not come. He then, as a last resource, gave a pint of Scotch ale with the desired effect; the patient had had a refreshing sleep, and had awakened practically recovered.

Dr. H. Woods said that chloral hydrate was so excellent a hypnotic that one of its compounds might probably be found which would be free from its defects. The principal of these were bad taste, depression of the heart, and slight analgesic influence. Chloral hydrate was frequently prescribed with one of the bromides, and he was of opinion that in such a mixture we had a definite compound formed. If the drugs were mixed in molecular proportions, the change was complete. Chloral hydrate mixed with ammonium bromide in solution appeared to form a compound which he might call ammonium trichlorethidene bromide (chloral hydrate being trichlorethidene alcohol). The above compounds decomposed in the solid state; but if chloral hydrate was dissolved together with ammonium bromide in molecular proportions, a liquid of a fairly good taste was obtained, which he found to be very free from depressing action on the heart, and which had a more definite analgesic effect than chloral. He found such a combination most effective in simple insomnia, and very harmless.

Dr. Gordon remarked that he had found valuable results from the action of paraldehyde in doses of 1 to 3 drachms; that it procured quiet, refreshing sleep, and that little gastric disturbance followed its use, and that syrup of lemons so far abolished its disagreeable taste. He recommended the use of urethan, in doses of 30 to 60 grains, in cases where a mild hypnotic action was indicated, and where there was not evidence of much pain; in cases of sleeplessness, in senile changes, in hysteria, and certain pulmonary conditions. From sulphonal he had obtained good results in many cases; he recommended, since the drug was insoluble, that it should be given in the finest possible state of subdivision, and, as the chlorides had a soluble influence on the drug, to combine it with them. In one case he noticed that the drug had a marked action over the motor apparatus, that the patient had extreme difficulty in walking, that he was giddy, and that all his movements looked like those of one under the influence of alcohol. But the higher centres were not much affected; the patient was able to answer any question, knew every person he saw; and no headache followed, although he slept nineteen hours, nor was the gastric function interfered with.

Professor Leech said, in reply, that the discussion indicated the necessity for a still more minute examination of the influence of hypnotic drugs. In order to use a drug with confidence, it was essential that we know its possible as well as its ordinary effects; that we should know the direction in which it tended to influence all the organs, for it

sometimes came to pass that an action usually little noticeable, in man at least, was exaggerated and became a marked, and it might be troublesome, feature among the symptoms produced by the drug on diseased conditions, or in individuals peculiarly constituted. By knowing thoroughly the physiological action of the drug, we might not only anticipate its possible evil influences, but might to some extent guard against them. Hence the great value of such work as that done by Dr. Gordon, to whom the thanks of all engaged in therapeutics were due. On one point his experience of urethan differed from that of Dr. Gordon, who had not been able to find that urethan produced sleep in healthy people in the daytime. Doses of 2 drachms had seemed to him (Dr. Leech) distinctly to induce sleep in healthy people in the daytime. It was not, of course, easy to say whether sleep which followed a drug was due to the drug or not, but he had seen sleep so often occur in those who had taken urethan, while it did not occur in those in the same ward who had taken nothing, that he could hardly doubt that the sleep was the effect of the drug. It must be remembered, however, that sleep tended to follow quickly after urethan ; and if prevented, as it easily might be, it did not occur again. Hence it so often happened that no sleep followed this drug's administration ; its chief use, indeed, was to accentuate the tendency to sleep. The experience of Dr. Gordon that repeated doses of urethan caused sickness was interesting, and coincided with the results noted in the paper in one case. With regard to sulphonal, it seemed, from the remarks which had been made, that this drug was capable of producing more unpleasant effects than had been supposed. Great difference of opinion appeared to exist as to the effect of this drug on the stomach, and it seemed just possible that different specimens of sulphonal might differ in the character of their effects. The difference in the effects noted from the use of hyoscine most probably arose from changes which occurred in the drug itself, but tropein compounds were apt to undergo spontaneous changes ; sulphonal was not. The experience of one speaker that ale was a useful hypnotic at times was quite in keeping with the views held by pharmacologists as to the influence of the alkyls, of which the sedative principle of the ale is one of the best known compounds. With regard to the use of bromide combinations, which had been mentioned, it seemed probable that our most prized hypnotics of the future would be those not containing halogen elements, since those elements tended to give combinations in which they were contained too great a depressant effect on lower nerve-centres and on muscle.

The discussion on the new hypnotics was opened by Dr. Leech, who read an elaborate paper as to the value of these remedies, the greater part of which has already been laid before the readers of the GAZETTE. We will simply add that from his own observations the order of hypnotic potency seems about as follows :

1. Sulphonal.
2. Amylene hydrate.
3. Paraldehyde.
4. Urethan.
5. Methylal.

He stated that none of these drugs equal chloral hydrate in the certainty of their action, although it is true that both sulphonal and amylene hydrate may succeed where average doses of chloral have failed.

INFLUENZA THERAPEUTICS.

The duration of an acute attack of influenza, or dengue fever, or whatever else it may be that ravages Eastern Europe and occupies the mind of the Westerns, is so short that no small amount of professional agility is required to make any headway with treatment before the malady has girded up its loins and betaken itself elsewhere, leaving a haggard and enfeebled ex-sufferer to mourn its loss. The principal remedies used in German and Russian hospitals and in private practice have been antipyrin and codeine, in the proportion of ten grains of the former to a sixth of a grain of the latter, in conjunction with a little bicarbonate of sodium. In some instances salol is reported to have mitigated the severity of the symptoms, any nasal trouble being treated at the same time by means of a lanolin ointment containing menthol and cocaine. A spray of wine of ipecacuanha and a dose of Dover's powder at bedtime is claimed to nip the affection in the bud, and there can be no objection to giving them a trial. Quinine and tonic meat and wine preparations are very useful after the acute stage is passed and the patient enters upon a limp and protracted convalescence. It is, of course, very difficult to gauge with accuracy the properties of the essential oils,

such as pinol or pumiline, in averting an attack, but they have the merit of being agreeable and refreshing.—*Medical Press and Circular*, December 25, 1889.

PICRIC ACID IN THE TREATMENT OF SKIN-DISEASES.

M. CAVELLI (*Gazette Médicale de Paris*, November 16, 1889) claims that picric acid is a remedy of great efficacy in the treatment of various skin-affections characterized by cutaneous inflammation. Thus, he claims that in the course of an epidemic of erysipelas he has obtained the best results by the external use of picric acid; so, also, in the case of lymphangitis, occurring in a gouty subject, as a complication of caries and necrosis of the phalanges of the toes, the local application of picric acid very rapidly reduced inflammation and pain. Similar effects were also obtained through the use of this remedy in a large number of cases of eczema and erythema. As regards the mode of action of picric acid, the author suggests that in penetrating the cells of the corneal layer, picric acid forms a protective layer in the skin, and that, in virtue of its astringent action, it affords a protection to the malpighian layer, so leading to a reduction of the inflammation. While, finally, he thinks that perhaps through entering into the lymphatic vessels picric acid may exert an antiparasitic action. He employs a solution in water,—of 1½ parts of picric acid to 250 parts of distilled water,—applied externally five or ten times daily.

VALUE OF SALICYLATE OF SODIUM IN DYSMENORRHŒA.

In the *Boston Medical and Surgical Journal*, December 19, 1889, DRS. E. REYNOLDS and G. HAVEN publish notes of fifteen cases of patients applying to the Boston City Hospital for relief of menstrual pain.

From these fifteen cases, two should be excluded on the ground that the relief may be, in part, ascribed to a general improvement due to other treatment. One of these was a case of general pelvic congestion, with an anteflexed cervix and an ill-developed uterus; the patient was packed on alternate days, and was given salicylate of sodium; and the next catamenia was for the first time painless. The second, a case of stenosis of the internal os, was treated by the use of dilators, and the salicylate of sodium was administered in anticipation of the catamenia, with marked relief of pain; but in neither of these cases does it seem safe to ascribe the improvement to the use of salicylate of sodium alone.

Of the remaining thirteen, three were found to have anteflexion of the cervix, three had catarrhal salpingitis, one was the subject of a membranous dysmenorrhœa (?), and one was affected with a bad endocervicitis, making eight cases in which a cause for the existence of the pain was found. Of the others, in two the pelvic organs were thought to be normal; in two no examination was made; and in the remaining case symptoms apparently due to a cystocele and a slight prolapse of the uterus were relieved by a pessary, without effect upon the very severe dysmenorrhœa, for which no cause was found; in all, five cases in which the symptoms were unexplained.

Of the three cases of anteflexion, one was not improved, one was partly, and one completely relieved; no other treatment having been employed. The three cases of salpingitis were all promptly and completely relieved so far as their dysmenorrhœa was concerned; although the improvement in the local condition was much more gradual and less marked. The case of membranous dysmenorrhœa was somewhat but not wholly relieved by her first experiment with salicylate, which she has not had time to try again; the patient with endocervicitis said, on her next visit, that she had "come round without knowing it,—a great change." She continues its use, and remains well. Of the five unexplained cases, both patients, with apparently normal organs, were completely relieved; the case of cystocele and prolapse with dysmenorrhœa from unknown cause, was also completely relieved; of the two who were not examined, the pain was wholly controlled in one, while the other was unrelieved. This latter patient was suffering from a sharp attack of probable subacute pelvic peritonitis, and was possibly not a fit subject for the experiment, but is added to the list for the sake of fairness.

In conclusion: of the thirteen cases, nine were completely and two partially relieved, while in two the treatment was without effect. In two of the cases (one normal, one of salpingitis) the omission of the salicylate was followed by a return of the pain, and at the next catamenia its resumption resulted in a painless flow. It was given to all cases in

10-grain doses, t. i. d., for the week which preceded the catamenia, and continued until the time when the pain usually disappeared; but it is an open question whether the same or larger doses given during a shorter time might not have been equally or more effective. We are unable to judge whether any permanent benefit resulted, and the authors say that they consider this report as a mere preliminary to further observation, which, with a larger number of cases, may, of course, largely alter the proportion of relief obtained.

A NEW ANTISEPTIC DRESSING.

At a meeting of the Medical Society of London on November 4, Sir Joseph Lister described a new antiseptic dressing, which he said he had now used for a year in his wards at King's College Hospital with excellent results. He recommended the new dressing as the most satisfactory that he had hitherto met with. Sir Joseph pointed out that though sal alembroth had been largely used in surgical practice in consequence of his supposed preference for it, its employment had never received his "published sanction." It had the disadvantage of being so excessively soluble that it was washed out of the dressings with the greatest ease by the discharges, so that there was always the risk, if the wound discharged freely, that the antiseptic would be altogether washed away, even if large masses of gauze were used. Further, the discharge in taking up the sal alembroth formed an intensely irritating solution, which produced crops of pustules and even large blisters near the edge of the dressings. In describing the numerous experiments he had carried out with the object of finding a better antiseptic, Sir Joseph Lister said that the real point to determine as to any given agent was not whether it would kill germs, but whether it would prevent the development of organisms. Mr. Martindale called his attention in February, 1886, to cyanide of mercury as a substance which might prove to be a valuable antiseptic, one, too, possessing the advantage of not coagulating albumen. Sir Joseph Lister found that this substance had a remarkable inhibitory power over the growth of organisms, but it had the drawback of being highly irritating. A double cyanide of mercury and zinc, formed by mixing together a solution of the double cyanide of mercury and potassium with a soluble salt of zinc, the zinc taking the place of the potassium, was then tried, with the result that it was found to possess most important antiseptic properties. In the proportion of $\frac{1}{5000}$ part it kept blood-serum perfectly free from the development of organisms for eighteen days in spite of potent septic inoculation. Dressings were then prepared by diffusing this "zinco-cyanide of mercury" in water, with a little glycerin added to fix it and prevent it from dusting out. In view of the very slight solubility of the double cyanide in serum, some of the very soluble cyanide of mercury was associated with it. Some admirable results were got with this "cyanide gauze," but it was found to cause irritation of a peculiar kind, and suppurations also sometimes occurred at a late period of the case, such as Sir Joseph had never been accustomed to with carbolic dressings. It was found that this could be prevented by first saturating the gauze with the double cyanide and then putting it into a solution of starch. This fixed the particles of the cyanide most effectually in the gauze. Subsequently the double cyanide and starch were prepared with sulphate of potassium; in this way the mixed salts could be powdered and easily diffused in water. This compound should be moistened before use with a $\frac{1}{4000}$ solution of sublimate, so as to destroy any organisms there might be in the dressing. The layer destined to be put next the skin is washed in a solution of carbolic acid; this washes out the sublimate. By this means Sir Joseph Lister said he had obtained perfect results in practice in wounds of every description.—*London Medical Recorder*, November 20, 1889.

THE USE OF OXYGEN IN THE TREATMENT OF LEUCHÆMIA AND GRAVE ANÆMIAS.

The treatment of the more serious forms of blood diseases is still so unsatisfactory that any addition to our means of counteracting them is deserving of record and careful scrutiny, and we, therefore, call attention to several cases of severe anæmia reported in the *American Journal of the Medical Sciences* for November, 1889, by Dr. J. M. Da Costa and Dr. E. P. Hershey, in which the changes in the blood were fully noted in every detail, and whose conclusions, therefore, rest on actual minute inspection of the blood-corpuscles. The first case was that of a boy, aged 13, who had been subject to attacks of jaundice from infancy; the mother states that she believes the child had a number of malarial seizures, but was not certain. When first seen (February 5, 1889)

the patient was pale, the conjunctivæ pearly and somewhat jaundiced. The spleen was enlarged, extending from the eighth rib to four finger-breadths below the margin of the ribs. The tumor had been noticeable for a year previous. For nearly two years the patient had spells of weakness, extending over a period of three weeks, and at intervals of two to three months. Occasionally hemorrhages from the nose occurred during this time, but never sufficient to cause alarm. His strength gradually failed, and he was discharged from his position as cash-boy in a dry-goods house, being unable to stand the work.

When first seen, the blood was examined, and found to contain a sufficient excess of white corpuscles to warrant the diagnosis of splenic leuchæmia. This view was substantiated by the fact of the white corpuscles steadily increasing in number, while the red diminished. February 5, 1889, the red numbered 2,350,000, the white 105,000 to the c.mm.; by May 20 the white corpuscles had increased to 320,000

Having been on arsenic some time previous to his first visit, the patient was given Basham's mixture and 3 grains of the extract of ergot three times daily, without, however, producing any effect upon the spleen. Galvanism was tried over the splenic region for two months without any improvement. Trinitrine was given at the same time, but the patient grew weaker under this treatment, and arsenic was again resorted to, though without amelioration.

On June 1 he began to inhale oxygen, and he improved rapidly under the treatment. He was given daily from twenty to thirty litres of oxygen, which was continued until August 5. At this time the boy returned to work, much better than when he had left it. The blood was again examined September 2, and found to be so near the normal that a count of the white corpuscles was considered unnecessary, the red being increased to 4,850,000, and one white found to about every four hundred red. The oxygen treatment was stopped.

The second case was that of a man, aged 35, who had a history of malaria and an attack of typhoid fever, in which he lost thirty pounds. He also had at one time suffered from hemorrhage from the nose, lasting for twenty-one days. The hemorrhages occurred daily, and were uncontrollable, except by plugging the nostrils; large doses of ergot and gallic acid were administered. By the time the hemorrhages had ceased his weight had fallen nearly fifty pounds, so that in about six months his weight was reduced from two hundred and twenty pounds to one hundred and forty-four. His habits had always been highly intemperate. When he came under the care of the authors he suffered from intense thirst and frequent micturition, passing large quantities of water, containing neither albumen nor sugar. The spleen was enormously enlarged; it passed nearly two inches beyond the umbilicus. There were profuse diarrhœa and great emaciation. Ergotin was administered three times daily, followed by tartrate of iron and potassium, and that by the sulphate of iron. Through the use of this treatment the diabetes insipidus disappeared. It was then resolved to try arsenite of sodium, which was administered in $\frac{1}{40}$ of a grain doses. There was some improvement under the use of arsenic and Basham's mixture for a time, but finally the patient grew worse, and oxygen treatment was commenced.

An examination of blood at this time showed that the red corpuscles had diminished to 1,440,000, and the leucocytes had increased to 1,120,000, a proportion of as 1 to $1\frac{1}{3}$. The patient had been in the West three months previous to this time. When he returned to Philadelphia it was found that the character of the disease had assumed a most serious type. His appearance was striking. The veins of the forehead were largely distended, and the capillaries plainly visible in many parts of the face, most prominent on the nose. The spleen was as large as ever, the abdomen greatly extended and tense, assuming a spherical shape. The knees were shaky; the feet were swollen, the swelling extending up as far as the knees. Shortness of breath was produced upon the slightest exertion; he always felt extreme fatigue. The spinal column was tender to the touch; the sitting posture produced severe pain in the bones of the ilium. A distinct anæmic murmur was heard over the base of the heart. Profuse watery discharges from the bowels had set in four days before his return, and still continued. He reported that he had been feverish for weeks, his temperature at that time (June 26) being 102.3°; he was much depressed in spirits. He stated that, having himself made a careful study of the disease, he knew there was not the slightest hope for him. He was willing and anxious that an experienced surgeon should attempt to remove the spleen, knowing that his chances were of the very slightest.

Besides the condition of the blood in regard to the relation of the corpuscles, it might be of interest to add that its color was opaque, it flowed freely from the puncture made by the lancet, and coagulated very slowly. Micro-

scopically, the red blood-corpuscles were found to be widely separated, extremely pale, and at no time formed in rouleaux. The leucocytes varied in size and shape; some were small, others of enormous size,—fully the one-five-hundredth of an inch in diameter; many were crescent-shaped as well as large, while others were shapeless.

After two days' inhalations of oxygen, the character of the blood was entirely changed; observed on the glass slide, the large and misshapen leucocytes had entirely disappeared, the red corpuscles formed rapidly in rouleaux, and the blood showed no abnormal character other than the relation of the white and red corpuscles.

From June 27 to July 3 the patient took nothing besides the oxygen, except a mild hypnotic upon retiring. Ten litres, three times a day, were inhaled. The oxygen was perfectly pure, and was allowed to pass through water, to prevent dryness of the throat. The effect at the end of the week was marked; the swelling of the feet was scarcely perceptible; the appetite was good; the bone pains had almost entirely disappeared; the temperature had steadily fallen, and the patient walked about with comparative ease. The number of white corpuscles had diminished nearly one-half, while the red had gained a million. During the second week the patient was given Basham's mixture, but it did not suit him, and at the end of the week it was discontinued. In the third week of the treatment the most marked improvement took place in the general condition. The fever disappeared entirely; there was no swelling of the feet; the prominent veins on the forehead and the capillaries visible on the face had almost completely passed from view; the appetite increased; there was shortness of breath only on violent exertion; and the patient was but little inconvenienced by walking a mile. By the end of the fourth week he had gained nine pounds.

During the oxygen treatment the spleen steadily decreased in size. No unpleasant symptoms attended the use of this treatment, which was steadily increased in amount until sixty litres were given in the twenty-four hours, and subsequently even one hundred a day were inhaled. No exhilarating effect was noticed nor influence on the action of the heart, but only a sense of freedom about the chest after the inhalation. During the treatment of these cases of leuchæmia two cases of chlorosis were also given inhalations of oxygen as an adjunct to the use of iron. In the first of these cases, at the commencement of treatment, the blood was found to contain but twenty-five per cent. of hæmoglobin, the red blood-corpuscles numbering 3,800,000 to the c.mm.; white corpuscles, 1 to every 480 red. After a month's treatment with oxygen, the red corpuscles were found to number 4,850,000 to the c.mm.; the hæmoglobin was ninety per cent.; the white corpuscles, 1 to every 600 red.

In the second case, the hæmoglobin was found to be thirty per cent., the red corpuscles numbering 5,000,000, and the white normal. Sulphate of iron was given with twenty to thirty litres of oxygen a day. After undergoing treatment for a short time, the patient's symptoms all totally disappeared.

The authors state that they have also under their care a case of undoubted pernicious anæmia, in which the first examination showed only 900,000 red corpuscles and the second 700,000, the hæmoglobin being twenty-five per cent. The patient is weak, to the very verge of exhaustion, and, although oxygen treatment has been commenced, it has not been used long enough to judge of its merits.

The mode of action of oxygen is not fully known. We have here a field in which the therapeutic powers of this gas may be, by continued observation, ascertained. Sticker has suggested that the white corpuscles absorb oxygen, and use it up in the blood, and this at the expense of the red corpuscles, and that the administration of the gas might be expected to restore the normal condition, as well as to aid in the conversion of white into red corpuscles.

In all cases of leuchæmia there is always found an impairment of some one or more of the blood-making organs, due at times to a known cause, at others to an unknown one. In the second case the history is that of decided disease of the spleen, long before the blood became markedly affected. It was not until the functioning power of the spleen was seriously diminished that the blood gave signs of leuchæmia; and, as it became more and more impaired by the overgrowth and distention of the diseased organ, the red corpuscles diminished and the white increased. We had, then, it seems, in the action of oxygen, a substitution for the function of the spleen. The treatment did in both these cases, artificially, what the damaged organ could not perform,—allowed the metamorphosis of the white corpuscles into red to go on. The hope in benefiting the patient is to keep up this substitution until the lesion is influenced by the improved nutrition, aided by other means; or, in appropriate cases, until the system is so far built up as to make sur-

gical interference a procedure much more likely to succeed. Whether permanent effects follow this oxygen treatment, or mere temporary benefit and prolongation of life, cannot as yet be said. In cases in which the structural changes are still slight, we believe the remedy may bring about a permanent change; in more advanced cases this is more doubtful. But, under any circumstances, that it prolongs life and produces results not to be otherwise obtained seems to be proved.

THE ACTION OF ASTRINGENTS.

Dr. R. Heinz has recently undertaken, in the laboratory of the Pharmacological Institute in Berlin, some researches as to the physiological action of astringent substances, of which the following data represent his most important conclusions (*Gazette Médicale de Paris*, No. 46, 1889):

He has found that tannin, alum, and the salts of the heavy metals, such as silver, copper, zinc, and mercury, when applied to the mesentery of a frog, in the form of dilute solution, produce marked vaso-constriction. This is, however, of but short duration, and soon gives place to vaso-dilatation, when the substances are applied in the form of a concentrated solution. Nitrate of silver is, however, an exception to this rule, and in every case produces constriction of the blood-vessels. This exception is only apparent, for when the application of the solution of .1 per cent. of nitrate of silver is prolonged vaso-dilatation follows the initial vaso-constriction. When a strong solution of nitrate of silver is applied, the constriction of the blood-vessels produced by the first particles of the nitrate of silver which penetrate the vessels cannot be transformed into a vaso-dilator effect, for the external coats of the vessels have become entirely rigid, as a consequence of a true coagulation of their walls. Thus it would seem that the astringents exercise a similar topical action on the walls of the blood-vessels, a variation of course occurring according to the varying degrees of concentration of the irritants employed. As regards the minimum degree of concentration necessary to produce vaso constriction, Dr. Heinz gives the following notes:

For corrosive sublimate the minimum degree of concentration is .005 per cent.; for nitrate of silver and sulphate of zinc, .01 per cent.; for sulphate of copper, sesquichloride of iron, tannin, and alum, .05 per cent. As regards the degree of vaso-constriction produced by the application of these different astringents, Dr. Heinz maintains that the nitrate of silver produces frequently the maximum degree of constriction. Acetate of lead and sulphate of zinc less frequently produce this result, while corrosive sublimate, sulphate of copper, and sesquichloride of iron produce intense vascular constriction, but which never reaches the maximum produced by nitrate of silver. With tannin and alum, the vaso-constriction is less pronounced. Experiments made on warm-blooded animals yielded perfectly confirmatory results. Other experiments made with tannin have shown that the vaso-constriction produced by the application of this astringent coincides with reduction of the intravascular blood-pressure, proving, according to Heinz, that the effect of tannic acid, while acting upon the vaso-motor centre, paralyzes and does not excite it. We cannot admit, however, that the facts enumerated above as to the vaso-constrictive action of these astringents is sufficient to explain their styptic action; without doubt this latter property is combined with the coagulative action upon the blood, which is only produced when the blood comes into direct contact with the astringent substances, thus forming clots with tannic acid, sesquichloride of iron, and nitrate of silver.

In experiments made on the ear of the rabbit, after the great sympathetic nerve had been cut, it was determined by the author that capillary hemorrhages were arrested by a ten per cent. solution of tannic acid, or by a twenty per cent. solution of the sesquichloride of iron; much more concentrated solutions were, however, necessary to arrest venous bleeding.

Finally, the author has noted that the application of astringents to the mesentery of the frog, while in a state of inflammation, arrests diapedesis of leucocytes, thus serving to explain the antiphlogistic action of astringents. His observations may be considered as supporting the argument in favor of the use of but moderately concentrated solutions, since the strong solutions often produced or increased inflammation instead of combating it.

DISINFECTION OF DWELLINGS BY MEANS OF SULPHUR DIOXIDE.

Within the past few years numerous experiments have been made by biologists with sulphur dioxide. The conclusion has been very generally accepted that it is unreliable in its action upon the contagion of disease.

Dr. Cyrus Edson, chief inspector of the Health Department of the city of New York, has had a wide experience with sulphur dioxide as a disinfectant, and is of the belief that it is a thorough and an almost perfect destroyer of the infective matter of the acute exanthemata and diphtheria.

In the *Medical Record* he publishes details of his experience with this substance, comparing the total number of cases of different contagious diseases with the number of cases recurred, the recurrence of which could be attributed to infection after fumigation, so as to show the efficiency of the agent in question.

In the year from October 1, 1887, to October 1, 1888, there occurred in New York three hundred and twenty-one cases of small-pox. These cases occurred in two hundred and twenty-seven houses. Eighty-two of these cases were contracted from exposure to some of the two hundred and thirty-nine original cases, nearly all of which were in their turn traced to direct exposure to other cases, either out of the city or in it. Nine cases could not be traced to their cause. They were probably due to contagion from some mild, unrecognized case, that travelled about spreading the disease. Not one single case of the disease was developed from the clothing or from the rooms in which these cases were, and from which they were removed to the hospital for small-pox. No other precaution was taken in the case of the rooms and clothing than that of fumigation by SO_2, in proportion of three pounds of sulphur to each one thousand cubic feet of air-space for at least two hours. This, however, was done in a most conscientious and careful manner, immediately after the removal of each case.

Again, in the year from October 1, 1888, to October 1, 1889, seven cases of small-pox occurred in five houses. All were traced to their cause, which was found to be direct exposure to a previous case. Not a single case occurred from infection left in the room or clothing by any of these cases.

Occupancy of rooms that have contained small-pox patients was always permitted as soon as they had been fumigated.

In this connection the effect of fumigation by SO_2 upon vaccine virus is interesting. On October 2, 1889, ten quill slips, charged with vaccine virus taken from a lot charged equally from the same animal, were exposed in a room $76 \times 15 \times 8$, to the fumes of one pound of sulphur for two hours. Each slip was then used to vaccinate a child that had never before developed vaccinia. All failed to effect any result. Ten other points from the same lot were effective upon all but one child of ten other primary cases. This child evidently had considerable resistance against vaccinia, as it only took after the third trial.

The same comparison of primary cases with secondary cases, in cases of small-pox, was made of scarlet fever, diphtheria, and measles.

First, scarlet fever. From January 1, 1888, to October 1, 1889, six hundred and twenty-six cases occurred in four hundred and fifty-three houses, and one hundred and thirty-five secondary cases occurred in eighty-seven houses.

Of the one hundred and thirty-five secondary cases, one hundred and six occurred within five weeks of the beginning of the primary cases, to the direct contagion of which they were presumably due. This leaves but twenty-nine cases, out of a total of six hundred and twenty-six, that were possibly due to contagion left in rooms and apartments after disinfection by means of sulphur dioxide after termination of each case.

During the same period (January 1, 1889, to October 1, 1889) five hundred and fifteen cases of diphtheria occurred in three hundred and eighty-two houses, and one hundred and fourteen secondary cases occurred in eighty of these houses. Seventy-nine of the secondary cases occurred within four weeks of the beginning of the primary cases, to the direct contagion of which they were, therefore, presumably due. This leaves only thirty-five cases, out of a total of five hundred and fifteen, that were possibly due to contagion of diphtheria left in rooms and apartments after disinfection by means of sulphur dioxide after the termination of each case.

In the case of measles, five hundred and fifty-seven cases occurred in three hundred and sixty-one houses, and one hundred and sixty three secondary cases occurred in ninety-five of these houses. One hundred and twenty-two of the secondary cases occurred within five weeks of the beginning of the primary cases, to the direct contagion of which they were, therefore, presumably due. This leaves only forty-one cases, out of a total of five hundred and fifty-seven, that were possibly due to contagion of measles left on the premises after disinfection by means of sulphur dioxide performed after the termination of each case.

These figures are interesting when carefully considered, and they show the relative

efficiency of sulphur dioxide in the case of each of the diseases. The gas is most destructive to the contagion of small-pox, and next, to that of scarlatina.

In the case of measles we have an explanation of the comparatively large number of secondary cases. The disease is a mild one, speaking comparatively, and many cases are not properly isolated in the homes of the poor; consequently rooms and materials are infected outside of the apartment in which the patient belongs and which the disinfector fumigates. Moreover, during the past two years there have been so many cases of contagious diseases that measles have frequently not received the attention of inspectors and disinfectors that should have been given to it, scarlet fever and diphtheria taking most of the time of the men.

The contagion of diphtheria would, from these statistics, seem to resist the action of sulphur dioxide most, and to be the most difficult to destroy. This is due to the manner of its infection. The other three diseases infect a room mainly by means of the medium of the air, the contagion being exhaled or given off from the body and deposited evenly over the surfaces exposed to the infected air. In diphtheria, membranes and secretions are also infected, and the contagion is protected by being surrounded by a protecting medium into which sulphur dioxide cannot easily penetrate. This is probably the reason why biological experiments with SO_2 are not satisfactory.

It is impossible to imitate in the laboratory nature's method of infection. The power of penetration of SO_2 into the culture-mediums cannot be very great. The medium must somewhat protect the culture within it, so that only those cultures are affected that are on the surface of the medium. Just as diphtheritic secretions protect diphtheritic contagion, so do culture-mediums, to a certain extent, protect cultures.

In nature's method of infection the infected air is carried by draughts and air-currents into cracks and corners accessible only to a gas liberated under much the same conditions as the contagion.

Conclusions.—It would seem that the proper and most practical method of disinfection of dwellings, after the occurrence in them of exanthemata and of diphtheria, is by means of sulphur dioxide, and that all clothing, bedding, etc., used in direct contact with the patient, should be removed to a disinfecting station, properly equipped, and there subjected to heat of sufficient intensity to destroy all contagious matter.

In the discussion of this paper by the American Public Health Association the method of fumigation was criticised, it being alleged that not sufficient moisture was present with the sulphur dioxide to insure the best results. A very important point in this connection was brought out. The use of alcohol to ignite the sulphur, as described in the paper, adds materially to the moisture in the air of the infected rooms. The amount of alcohol used is about four ounces to each charge, say six pounds. This amount of alcohol will develop fifty quarts of steam, approximately.

ABRUS PRECATORIA.

At a recent meeting of the Society of Naturalists of Dorpat, PROFESSOR KOBERT (*Wiener Medizinische Blätter*, November 7, 1889) presented an account of a new poison, of an albuminous nature, which he had extracted from the seeds of the *Abrus precatoria*, —a plant already known for hundreds of years. These seeds occur in the form of red bodies, about the size of a pea, with a black spot on them, and are spoken of in the Indies as "chicken eyes," while in Germany they are described as "paternoster-erbsen," from whence the attribute "precatoria" originates. As a remedy, the *Abrus precatoria* seeds have been for a long time employed as irritants and antihemorrhage remedies; in India they are frequently employed for poisoning, while in Brazil they are used in the treatment of ophthalmia. In India the seeds are rubbed up in their fresh condition, and then rolled up into a fine roll, whose sharp point stuck into the skin is sufficient to kill any man or animal, and leaves no more mark than the sting of an insect. It is stated that entire English colonies have been murdered in India in this manner. Professor Kobert has examined the albuminous constituent, and has found that it is one hundred times more poisonous than strychnine, and is similar in its action to the poison which may be extracted from castor-oil seeds. Like all other albuminous poisons, it loses its activity when boiled, and consequently the *Abrus precatoria* seeds may be even used as food. Dr. Kobert has found that death is caused, when this poison is introduced into the blood, through the coagulation of the blood-corpuscles.

HYDRONAPHTHOL AS A SPECIFIC IN THE TREATMENT OF TINEA TONSURANS.

In hydronaphthol Dr. Morgan Dockrell (*Lancet*, November 30, 1889) claims that he has found a remedy, which is practically a specific, in combating the ravages of trichophyton fungus in tinea tonsurans, a secondary compound of beta-naphthol, and was obtained from it by Justus Wolf, of New York, by a molecule of hydroxide having displaced an equivalent of hydrogen in the process. It has a slight aromatic taste, is almost odorless, sparingly soluble in water, but easily dissolved in alcohol, ether, chloroform, and glycerin; it is non-poisonous, non-irritant, non-corrosive, according to Mason precipitating albumen and gelatin in their neutral or acidulated solution, on which function is based its antiseptic action, and by it the contents of the protoplasm are caused to congeal, and in a supersaturated solution their destruction is complete; hence its germicidal and prophylactic properties. 15 grains in a single dose have been taken internally without bad effect. In the multiplicity of recommended treatments for tinea tonsurans we have no unanimity in many important particulars, which must materially influence the duration of the disease and the propagation of infection. We have, in fact, as much difference in opinion as to whether epilation should be employed, whether the head ought to be shaved or the hair cut short, as there was in the nomenclature after Willan first described it as "porrigo scutulata," and we do not seem to have got much farther than Willan had in 1810, when he stated that the disease "was hard to cure and very contagious."

Hitherto the failure in the treatment of tinea tonsurans has been due, in the first place, to allowing oxygen too free access to the fungus, acting, in fact, as if we did not know that it is necessary, for a mould fungus to flourish, that it should be abundantly supplied with oxygen, and kept at a temperature below the normal state of the body; secondly, we have not adopted the best means of securing penetration of the remedies employed, and there has been gross neglect in preventing the spread of the disease by using applications which cast a slur on antiseptics; and, lastly, we want a potent germicide which does not set up extensive dermatitis.

Hydronaphthol apparently fulfils the functions of and is superior to corrosive sublimate as a germicide, from the fact that it is non-poisonous and non-irritant. As the best means of applying this remedy, the plasters of hydronaphthol give excellent results, limiting the propagation of the disease, and causing a more rapid penetration of the germicide than any other means that can be applied. The plasters also help in starving the fungus, and to perfect this it is best to hermetically seal the plaster round in the way described below. Have the head completely shaved, leaving the usual fringe all round; then wash with a five per cent. soap of hydronaphthol, using water as hot as can be borne. After drying the scalp, apply over the affected area a ten per cent. plaster of hydronaphthol in narrow strips, letting each strip overlap its fellow, taking care that the plaster extends quite half an inch beyond the margin of the diseased patch. Outside the margin of the plaster paint a layer of a ten per cent. hydronaphthol jelly (when melted) so as to exclude all air. At the end of four days remove the plaster, when the diseased stumps will be found adhering to it. Repeat all the previous process, applying for one week a twenty per cent. plaster. Repeat the process, this time applying the ten per cent. plaster for ten days, when, on removal, the disease will be found to be cured. During the plaster treatment apply a five per cent. ointment to the unaffected portions of the head night and morning. Care should be taken that all articles brought in contact with the head before treatment be destroyed, otherwise reinfection will take place, and the treatment be brought into discredit.

THE LOCAL ACTION OF HELLEBOREIN.

Venturini Vittorio and Gasparini Elvidio, experimenting with a solution of helleborein by instilling a few drops into the conjunc ival sac of rabbits (*Deutsche Medizinal Zeitung*, No. 83, 1889), after about fifteen minutes, have induced complete anæsthesia of the cornea to such a degree that it might be strongly irritated with a needle without the animal showing the slightest evidence of any painful sensation. The same experiments were completed upon several dogs,—that is, marked anæsthesia of the cornea, without any alteration in the pupils. A solution was then prepared, of which each drop contained $\frac{1}{124}$ grain of helleborein, and the instillation of 3 or 4 drops of this solution in the conjunctival sac of dogs or rabbits completed anæsthesia in fifteen minutes,

so that the cornea might even be pierced with a needle without the animal apparently feeling it. Half an hour after the commencement of the anæsthesia the cornea reacted and regained its sensibility. In no cases were there any after-effects worthy of mention. From these observations the authors conclude that helleborein is equal to cocaine in producing local anæsthesia of the conjunctiva and cornea, and is to be preferred to it for operative purposes, since its anæsthetic action is confined to the cornea, while the sensibility of the other parts is unaffected. The authors consequently draw the following conclusions from their experiments:

First.—That a very dilute solution of helleborein gives complete anæsthesia of the cornea without causing the slightest irritation. That the anæsthesia so produced is of longer duration than that which may be evoked by cocaine.

Second.—Helleborein produces complete anæsthesia without producing any alteration whatever in any of the ocular tissues.

Third.—It causes no alteration in the pupil or change in intra- and ocular pressure.

Finally, helleborein produces local anæsthesia at any point where it is injected. As it possesses marked toxic action upon the heart, its application in the latter manner must only be employed with the very greatest caution, and is, in fact, in all cases attended by danger.

THE INFLUENCE OF OPIUM AND MORPHINE ON URIC ACID CONSIDERED WITH REFERENCE TO THEIR ACTION IN HEALTH AND DISEASE.

Dr. A. Haig has already called attention to the fact that he believes that morphine causes retention of uric acid, and that the result of this is a fall of arterial tension, the effect being exactly the same, whether the retention is produced by opium, by acids, or other substances. In the *British Medical Journal* for November 30, 1889, he maintains that the effect of morphine on mental depression, and other mental states and conditions, is the result of its action on uric acid and arterial tension, or is, at least, the exact parallel of the action of other drugs which affect the excretion of uric acid and arterial tension in the same way; and that it is thus possible to produce what is practically the same result by several drugs. Dr. Haig believes that the effect of opium and morphine on uric acid and arterial tension explains the good effects that have been observed in uræmia and uræmic and other convulsions. Dr. Haig's position in regard to the action of opium and morphine amounts to this. A large number of drugs, iron, lead, the mineral acids, and their salts, antipyrin (?), nitroglycerin (?), have one effect in common,—namely, that of diminishing the excretion of uric acid in the urine,—that is, driving it out of the blood into the liver, spleen, joints, etc. Exactly coinciding with a fall of pulse tension, and a mental condition of brightness and well-being, uric acid headaches or mental depression, if present, are cured, and in their place comes pricking and shooting pains in the joints, most marked in those who have previously suffered from gouty arthritis. On the other hand, an alkali, as soda or potash, while increasing the excretion of uric acid, produces symptoms which are the exact reverse of those above mentioned. As these drugs have no obvious properties in common, Dr. Haig has inferred that the results which they produce are due to their action on uric acid. Opium and morphine diminish the excretion of uric acid, and at the same time reduce pulse tension, cause mental brightness and well-being, cure a uric-acid headache, and cause at the same time pricking and shooting pains in the joints; they, therefore, belong to the iron, lead, and acid group of drugs, with which their effects exactly correspond, and, as they always cause a marked rise of the acidity of the urine, Dr. Haig concludes that their action on uric acid is the result of their action on acidity.

Further, it has been noticed that morphine is of great value in certain uræmic and puerperal convulsions, which are generally accompanied by a high tension pulse. He suggests that its curative action in these cases is also due to its effect on uric acid, and that further investigation may show that these convulsions, like those of ordinary epilepsy, have a more important relation to the excretion of uric acid and its effect on pulse tension than has hitherto been suspected.

TREATMENT OF SCARLATINAL NEPHRITIS.

In the treatment of nephritis as a consequence of scarlet fever, it should always be remembered that secretory trouble is the consequence of inflammation, and one should never lose sight of the fact that the glands are inflamed, and should be saved as much as possible in the execution of their function.

As a consequence, the organs which are vicarious to the kidneys, should be led to substitute themselves for the latter organs to as high a degree as possible, since, by exciting the secretion of the skin, we may not only remove water, but also the excrementitious matters which are naturally removed by the kidneys. Of all the diaphoretic measures, the one which seems to have been the most satisfactory in the discussion recently held on this subject before the Société Méd. Chirg. de Liége (*La Pratique Médicale*, October 29, 1889) was the warm bath, followed by wrapping in blankets. Ziemssen declared that his long experience has led him to recommend this mode of treatment in the highest terms, especially recommending that the temperature of the baths be gradually increased; a method which is likewise recommended by Liebermeister, who advises that the temperature of the bath should be increased from 105° to 107½°, the duration of the bath lasting from half an hour to an hour, while the patient after each treatment should be wrapped up in blankets until profuse perspiration occurred. It is worthy of note that the application of the hot bath may not produce any marked perspiration until it has been employed for two or three days in succession, while even then, though the effusions are insignificant, on the third day the perspiration will become abundant. In grave cases of nephritis, where there is almost complete anuria, and where dangers of uræmia are present, pilocarpine should be employed in addition to the warm baths; likewise champagne and aërated waters should be given in milk, in a preparation of 1 to 2, while it should be remembered that in all cases of scarlatinal nephritis milk is not only a food but a remedy. In internal treatment, digitalis occupies the first rank, and acetate of potassium, or of ammonium, may be added to it with advantage. During the convalescence, even after albuminuria has disappeared, there should be the greatest care observed not to overexcite the kidneys. The greatest caution should be observed against chilling the surface of the body. Alcohol should be avoided.

THE ADMINISTRATION OF CERTAIN DRUGS BY ELECTRICITY.

At the meeting of the Harveian Society, held November 7, 1889, Dr. Cagney read a paper with the above title, in which he referred to the experiments of Eulenburg, Von Bruns, and Hermann Munk, who had shown that certain drugs can be made to pass through animal tissues between the poles of a galvanic current (*Lancet*, December 21, 1889). He had used iodide of potassium in this way for the cure of labyrinthine deafness and in lead palsy. Only very small doses, however, can be administered through the skin. The method is best adapted for the treatment of diseases of the skin itself or tumors immediately beneath, and of mucous membranes. The indications are those for the local use of iodine and iodide of potassium. In affections of the throat, syphilitic and simple, and especially in chronic pharyngitis, it is very useful. Nodes and gummata in accessible situations seem to yield steadily to it; and this is equally true of tubercular ulcers in the later stages of syphilis, mucous patches, and papular syphilides. Among non-specific affections it serves well in the treatment of indolent ulcer, lupus, and acne, and to promote absorption in enlarged glands of scrofula. Benefit might be expected also in bronchocele and exophthalmic goitre. The method seems to possess certain advantages. By its employment it is possible to administer, in perceptible doses, a drug which is among the most useful we have,—a drug, moreover, which is not readily tolerated by every constitution,—and in a manner which is least likely to disturb the system. It is conveyed directly to the part where its action is needed, and presumably in a nascent state,—that is, a state of maximum activity. Finally, the lesion, if it be due to errors of nutrition,—or if, as in metallic poisoning, it be attended with paralysis,—is at the same time benefited by the stimulating action of the galvanic current. In the application of the method great current strength is not needed. It is current density which is requisite, and the tissues under treatment must be brought directly in the path between the poles. The electrodes may be either sponges holding solution of iodide of potassium, or a modification of Dubois's conducting-tube filled with the fluid. The latter gave the best results in Munk's physiological experiments, and doubtless they are to be preferred where the skin has to be penetrated. They should then be of large size. For the treatment of mucous surfaces an electrode may be made of a glass tube, which can be filled with fluid, having a zinc wire introduced through the bottom, and the mouth (cut to any desired curve) blocked with a fine sponge. This is connected, by means of the zinc wire, with one pole of a galvanic battery. The electrodes should be of large surface area. The fluid should be a saturated solution of iodide

of potassium, and it ought to be applied, where possible, at both poles. Where this is not possible, the solution should be at the negative pole. The current should be passed for ten or fifteen minutes, and its strength will be determined by circumstances. Its direction should be reversed every minute. This is important, and it is one reason why both poles may be charged with advantage. Under suitable conditions the positive pole may be carried by a gold needle, which is plunged in a convenient situation beneath the skin. This expedient serves especially in the treatment of strumous glands, and perhaps of bronchocele. By its means the obstacle arising from the depth or inaccessibility of the part under treatment may sometimes be overcome.

THIOL AND ICHTHIOL.

Thiol, like ichthiol, is a mixture of sulphated hydrocarbons, and possesses a faintly bituminous odor, which is, however, not disagreeable, and has a bitter, astringent taste. In commerce it occurs in two forms,—either in the state of a liquid, which is, in fact, a watery solution of thiol (forty-five per cent.) of syrupy consistence; and the dry thiol, in a fine brown powder, which is entirely soluble in water, and not altering when in suspension in this liquid.

Thiol possesses similar properties to ichthiol, as claimed by Bouzzi (*Gazette Médicale de Paris*, No. 46, 1889), but is equally efficacious in the treatment of various dermatoses, such as seborrhœa, acne vulgaris, acne rosacea, etc.

Dr. Lange is not as favorably disposed towards thiol, and he claims that the comparison between the use of thiol and ichthiol, both through external and internal application, has always terminated to the advantage of the latter. It would thus seem that there are no sufficient reasons for substituting thiol for ichthiol in dermatological practice.

MENTHOL IN ACUTE RHINITIS, INFLUENZA, AND OTHER AFFECTIONS OF THE NOSE AND THROAT.

It may be of value, as claimed by Mr. J. Lennox Browne (*Medical Press*, January 8, 1890), to know that the vapor of menthol checks in a manner hardly less than marvellous acute colds in the head, and is also to be recommended, with a certainty of success if used on its first onset, in arresting or as a preventive of infection in epidemic influenza, and this even for cases in which the nasal symptoms commonly associated with the word influenza are not manifested.

Menthol exerts its action, according to Mr. Browne, in the following manner:

1. It stimulates to contraction the capillary blood-vessels of the passages of the nose and throat, always dilated in the early stages of head cold and of influenza.

2. It arrests sneezing and rhinal flow.

3. It relieves, and indeed dissipates, pain and fulness of the head by its analgesic properties, so well known by its action when applied externally to the brow in cases of *tic douloureux*.

4. It is powerfully germicide and antiseptic. It thus kills the microbe of infection, and prevents its dissemination.

The remedy may be employed by means of a general impregnation of its vapor through a room or house, or locally to the nostrils and air-passages; for both which purposes there are several methods.

a. A ten to twenty per cent. solution of menthol in almond oil, in liquid vaseline, or in one of the many other odorless paraffin compounds, can be sprayed into the nose or throat, or about a room.

b. By placing 20 or 30 grains in an apparatus designed for administering the drug in cases of laryngeal consumption by inhalation, in the form of vapor mingled with steam.

c. By placing a similar amount, or 1 to 2 drachms of the oily solution, in a steam draft inhaler or bronchitis kettle.

d. By the simple arrangement of placing a saucer of water containing a similar quantity of the crystals over a gas-burner in the hall, by means of which the whole house is kept constantly permeated with the drug.

e. But by far the most convenient method for personal use is to carry always the pocket menthol inhaler, which should be used not only on the first approach of an attack, but three or four times a day during an epidemic, and always in cold-catching weather by those subject to head colds.

The instrument consists of a glass cylinder four inches in length, half an inch in diameter, and open at both ends. The tube contains crystals of menthol closely packed and prevented from escape by perforated zinc and cork. The opening at one end is twice the size of the other, the larger being intended for inhalation by the mouth, the smaller for the nostril. The latter is the method which Mr. Browne by preference

recommends. It is not to be simply smelt, but well sniffed or inhaled, so as to cause some tingling or smarting, a sensation which is quickly followed by that of coolness, and openness of the previously "stuffed" and heated nostril.

CACTUS GRANDIFLORUS IN SOME FORMS OF HEART-DISEASE.

In the *British Medical Journal*, January 11, 1890, DR. ORLANDO JONES publishes a paper in which he calls attention to the claim for *Cactus grandiflorus* that it is likely to prove a valuable adjunct to our resources in some diseases of the heart.

The difficulty of finding a remedy for some forms of heart-disease, and the fact, which is more or less recognized, that digitalis, strophanthus, and convallaria, although very valuable, are not always reliable in the varied conditions of the heart with which the physician meets, are sufficient reasons for bringing under notice this new drug. While the beneficial action of digitalis is often most marked where the heart has been overstimulated, as in delirium tremens, its action has often been disappointing when dealing with a feeble heart, especially if that feebleness is excessive and of long duration. Dr. Lauder Brunton has shown that the action of digitalis is divided into three stages. The first stage is that of stimulation of the vagi; the second is sudden depression of the vaso-motor apparatus of the renal arteries; the third is depression of the vagus, exhaustion of the ganglia, weakening of the heart, and, as Dr. Mitchell Bruce wisely puts it, the circulation begins to fail.

With *Cactus grandiflorus* the action seems to be the very opposite,—that is, the final stage of the action of the drug is that it strengthens the heart, and, consequently, the circulation improves, and the final exhibition of this drug is the reverse of that seen in digitalis.

The author maintains that while digitalis appears to be a drug that is most applicable to sthenic or overstimulated conditions of the heart, *Cactus grandiflorus* appears to be applicable to asthenic conditions of the heart.

The first case to which Dr. Jones called attention was that of a youth of about 13 years of age, of strumous diathesis, weedy habit, very feeble, and the heart very weak. Under the steady exhibition of cactus, the heart improved, and the patient grew to be a young man of fairly good health.

The next case was that of a man, aged about 60, who came under treatment, saying he could not continue his work owing to the suffering produced by exertion. He was found to be suffering from mitral disease, accompanied with loud mitral murmur, and was given cactus and ammonia. He so far improved that he was able to resume work, and continued it for some years till he left the neighborhood.

The third case is alluded to as that of a man with feeble heart, liver diseased, and general dropsy, the patient having already been tapped several times before coming under Dr. Jones's care. Under the action of cactus the patient's health is stated to have greatly improved, his heart renewed in strength, and the dropsy almost entirely disappeared.

Cactus grandiflorus attracted some attention a few years ago as a cardiac tonic, but it does not yet seem to have obtained a fixed position. It should receive further study.

THE ACTION OF LOBELINE.

In the *Archiv für Experimentelle Pathologie und Pharmacologie*, 26 Band., Heft 3 and 4, DR. H. DRESER publishes an elaborate pharmacological essay, made in the Laboratory for Experimental Pharmacology in Strasburg, as to the properties of lobeline, obtained from *Lobelia inflata*. The following is an abstract of his results:

Lobeline is the only active principle of *Lobelia inflata*. It is a fixed alkaloid, non-volatile, and in no respects analogous to a glucoside, and which, following certain chemical precautions, may be obtained in the form of a combination with a salt of platinum. One part of this double chloride of platinum and lobeline is crystalline, while the other more considerable part forms an amorphous salt. Both of these salts are endowed with the same pharmacological properties. Warm-blooded animals poisoned by means of lobeline succumb to respiratory paralysis, so it is to be included among the respiratory poisons. In dogs the physiological action of lobeline is first manifested by a paralysis of the voluntary movements and by a concomitant exaggeration of the reflexes. Later these effects are complicated by a paralysis of the motor nerves, analogous to that produced by curare. Through its paralyzing action on the cardiac branch of the pneumogastric, lobeline resembles in its action the nicotine group. In warm-blooded animals the influence of lobe-

line is found in a great exaltation of the respiratory activity. It produces an acceleration of the respiratory movement, which is more persistent when the pneumogastric nerves are intact than when they have been divided. Further, the amplitude of the respiratory movements is increased, and the power of the respiratory muscles appears to be also augmented. Under the influence of comparatively small doses of lobeline the inhibitory influence of the pneumogastric on the heart, as well as its action on the bronchial muscles, is suppressed. The respiratory muscles appear to receive especial stimulation from the respiratory centre when the latter is under the influence of lobeline; as a result, the work accomplished by the heart and respiratory muscles is greatly augmented. In comparison with the other agents which stimulate the respiratory functions, lobeline possesses the advantage over hydrocyanic acid in its freedom from depressing action, while it surpasses aspido-spermine in energy. It therefore seems evident that the employment of lobeline as an antiasthmatic is substantiated by experimental facts, though the author has not made any clinical experiments and offers no suggestions as to the proper form of employment of this alkaloid.

USE OF ATROPINE AS AN ANTAGONIST TO CHLOROFORM.

From the fact that atropine paralyzes the inhibitory nerves of the heart and acts as a stimulant of the respiratory centre, ALBERTONI many years ago recommended the use of atropine in accidents occurring during the use of chloroform as an anæsthetic, or in conditions where the heart was arrested through reflex stimulation of the vagus and paralysis of respiration. He based this advice on his experiments on dogs, which, while, as a rule, highly susceptible to chloroform, were yet able to sustain the administration of immense amounts of chloroform, if atropine was injected subcutaneously before the production of anæsthesia. Caselli and Secondi repeated these experiments in numerous cases of accidents occurring with the use of chloroform, and they now state that they never administer chloroform without having previously given a hypodermic injection of atropine. In the *Centralblatt für Klinische Medicin*, No. 45, 1889, there is an account of a number of experiments made by Dr. L. Vincini in this connection, his results serving to confirm Albertoni's statements, and success only failing to appear when such an immense amount of chloroform was given that there was coagulation of the heart tissue produced. He likewise recommends, in every case of chloroform anæsthesia, as a prophylaxis, the subcutaneous injection of $\frac{1}{82}$ of a grain of atropine. Half the amount may be given to children, while double the dose may be given in an emergency from the use of chloroform.

COMPARATIVE ACTION OF THE NATURAL AND ARTIFICIAL SALICYLIC ACIDS AND THEIR SALTS OF SODIUM.

At the last meeting of the British Medical Association DRS. M. CHATERIS and W. MACLENNAN read a paper as to the general comparative action of the natural and artificial salicylic acids and their salt of sodium, before the Section of Pharmacology and Therapeutics, based on their results obtained from an experimental research (*British Medical Journal*, November 30, 1889).

Their results prove that: 1. Salicin, in a dose of 30 grains, seems to have no injurious influence on the life of a rabbit, but that it diminishes the temperature about 1°. 2. That salicylic acid obtained naturally by oxidation of salicin, or from the oil of winter-green, in 10-grain doses, has also no deleterious effect. 3. That salicylate of sodium obtained from the natural salicylic acid, in 32-grain doses, is not lethal, but that it causes prostration and lowers the temperature.

On the other hand, it is conclusively demonstrated that: 1. Salicylic acid, artificial, in 10-grain doses, causes, first, paralysis of flexors; secondly, death by violent convulsions. 2. Salicylate of sodium, artificially, in 18-grain doses, is lethal; in 4-grain doses it causes paralysis of the hind limbs; in 8-grain doses, circular and rotatory movement, with paresis and dragging of the hind limbs; further, in 12-grain doses, it causes pronounced paralysis of the hind limbs, and marked progressive prostration, and that 18 grains cause not merely paralysis of the hind limbs, but a paralytic condition of the fore limbs, and entire loss of control of muscle movements, and death supervenes in a short time.

The deductions from these experiments indicate that artificial salicylic acid and its salt of sodium are dangerous, and, in large doses, fatal to animals, while salicin, natural salicylic acid, and its salts of sodium are not. Now, on what does this difference depend? Doubtless on some impurity in the artificial

acid, and corroborative evidence, though not yet completed, is afforded by the following letter received from G. G. Henderson, M.A., B.Sc., of the Chemical Laboratory of the University of Glasgow:

"I find, on examination, that the sample of artificial salicylic acid you left with me is not pure, but contains a small quantity of another acid, which I have no doubt is the cause of the appearances observed after the use of artificial salicylic acid. I attribute the presence of this impurity to the fact that the phenol used in preparing salicylic acid synthetically is not pure, but always contains other substances (cresol, etc.), of some one of which the acid found in salicylic acid is probably a derivative. I had not enough of the impurity to make a further examination of it, but it is certainly not salicylic acid. I should add that no trace of this substance is to be found in natural salicylic acid."

After a very careful analysis, Mr. Henderson isolated the impurity referred to. It was in the form of a buff-colored powder, and it was found to be more soluble than salicylic acid; 1 grain of it was dissolved in 20 minims of rectified spirit, and injected into a rabbit weighing six pounds, but without any visible effect. After the expiration of half an hour, 2 grains similarly dissolved were injected, and in ten minutes, and without rotatory movements, the breathing became very rapid, the arteries of the ear were alternately dilated and contracted, and the animal lay prostrate, with its fore and hind legs stretched out. Again, in half an hour, the same quantity—2 grains—was injected, and the prostration became more intense, the respirations lower, and a fine tremor was detected in the muscles of the face. In the course of two hours there was a slow improvement, but never a complete or even partial recovery, and ultimately the rabbit died, after thirty-six hours, being unable during that time to eat anything.

The action of this impurity seems to be of the nature of a slow but certain poison, and the lethal dose is relatively much less than that of salicylic acid. The rabbits in the previous experiments weighed only fourteen ounces, and in this case six pounds, so that the lethal dose would correspond to about 1 grain for a four-pound rabbit.

The obvious conclusions from these experiments are that artificial salicylic acid contains an impurity or impurities, and until this or these can be extracted by the aid of chemistry the internal administration of it or its salt of sodium should be discountenanced. Large and repeated doses of the sodium salt are necessary in the treatment of acute rheumatism, and hence we may account for the restlessness, the confusion, and the delirium sometimes attendant on its use, which have been testified by clinical experience. It is more than probable, too, that the retarded convalescence occurring in some cases of acute rheumatism after the salicylate treatment is due to the great and protracted prostration which the impurity or impurities give rise to. It is to be remembered in connection with these symptoms that prescriptions of the salicylate of sodium are invariably made up, unless otherwise indicated, from the artificial and not the natural salt.

THE TREATMENT OF PHARYNGEAL INFLAMMATIONS BY THE INTERNAL ADMINISTRATION OF SALOL.

In a recent number of the *Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx*, DR. GOUGUENHEIM reports twenty-two cases of inflammation of the soft palate, of tonsillitis, simple pharyngitis, and other forms of pharyngitis treated with the most remarkable success by the internal administration of salol in doses of 45 to 60 grains daily in three separate doses. Dr. Gouguenheim acknowledges his indebtedness to Dr. Caport, of Brussels, who first called his attention to the remarkable value of this remedy in the treatment of suppurative tonsillitis, and on this account was led to test its value in various forms of angina. On account of insolubility, the remedy was simply suspended in a mucilage, with directions given to shake it well before using it. The diet was almost exclusively restricted to milk. In all Dr. Gouguenheim's cases there was the most remarkable rapidity observed in the cure of dysphagia, no matter what might have been the cause of the angina; in four cases of severe scarlet fever the same effects were noted. In suppurative tonsillitis, although the results were evident enough to be highly satisfactory, the effects were not as striking as in simple inflammatory affections, though even here the author claims that his success surpasses what was to be expected from any other form of treatment. In some cases the daily dose of 60 grains was exceeded, 90 grains being given in one case where the angina had been complicated by articular rheumatism. In most of the cases there was marked reduction of temperature,

although normal, with reduction in the swelling of the throat, fever, and dysphagia. In the October number of the GAZETTE, on page 701, we alluded shortly to the properties of salol in pharyngitis; but Dr. Gouguenheim's researches are so striking that we thought it would be well to publish the additional details of his cases.

THE ANTIFERMENTATIVE TREATMENT OF INFANTILE DIARRHŒA.

At the meeting of the Harveian Society, held November 7, DR. LUFF read a paper upon the treatment of that variety of acute infantile diarrhœa produced by irritative products, resulting from fermentation produced in milk, either previous to or after ingestion (*Lancet*, December 21, 1889). Dr. Luff, while admitting that though probably several irritating substances resulting from the fermentation of milk are factors in the production of the form of acute infantile diarrhœa under consideration, contended that the principal share of the blame rests with the milk or cheese ptomaïne—tyrotoxicon—produced during the fermentation of milk under certain conditions. The treatment of acute infantile diarrhœa with the view of arresting the abnormal intestinal fermentation was then considered. Carbolic acid, creosote, resorcin, salicylic acid, salicylate of soda, naphthol, and salol have been given in the hope of checking the putrefactive changes in the bowels. Ringer has recommended the administration of a weak solution of bichloride of mercury in infantile diarrhœa attended with very slimy stools. Dr. Luff then referred to Illingworth's antiseptic treatment of infantile diarrhœa, which he had himself found most useful, and the employment of which had first directed his attention to the treatment he had employed. This consists in drug treatment and diet treatment combined. The drug treatment consists in the administration of $\frac{1}{6}\frac{1}{0}$-grain doses of the biniodide of mercury dissolved in iodide of potassium, combined with 1-grain doses of chloral hydrate. It was shown experimentally that the soluble biniodide of mercury is an extremely soluble and diffusible salt, and that it possesses the property of combining with and rendering insoluble the milk ptomaïne,—tyrotoxicon. As regards the diffusibility of the biniodide of mercury, Dr. Luff has detected it in the urine within two hours of its administration. He has never found that the soluble biniodide of mercury itself acts as an intestinal irritant. Of eighty cases of acute infantile diarrhœa treated by this method, the diarrhœa ceased within two days in seventy-two of the cases; in five of the remaining eight cases it ceased within four days, and in no case did it last over seven days.

ESERIDIN.

In the latter part of 1888 Eber discovered in physostigmine, by treatment with iodic acid, a base which was purer and less poisonous than physostigmine. A series of interesting experiments made with eseridin on rabbits, horses, cattle, hogs, dogs, and cats has recently been published (*Deutsche Medizinal Zeitung*, December 9, 1889), of which the following represents the most important results. According to the size of the dose, there is first excitement, then progressive paralysis of the brain and the medulla oblongata, the vomiting and respiratory centres and cardio-inhibitory centre being successively affected. The temperature and voluntary muscles were not affected; while at first there is increase of blood-pressure, coinciding with reduction in the frequency of the pulse, later the conditions as regards the circulation are exactly reversed. From irritation of the pneumogastric centre there is marked increase of the peristalsis of the stomach and the intestine, accompanied by at first normal and subsequently watery discharges, with evidences of nausea or even actual vomiting. The excretion of eseridin in the intestine produces direct irritation of the nerve plexus of the bowels, and so leads to peristalsis and secretion of mucus. As a consequence of the results so portrayed, Dr. Eber recommends the employment of eseridin, and especially in veterinary practice, as a stimulant to the stomach and intestine and to the brain and spinal cord. It is free from the cumulative action of strychnine. The doses which he employed for a horse were about 1½ grains, for a cow 3 grains, while the dogs and cats received about $\frac{1}{6}\frac{1}{4}$ of a grain for every two pounds of body weight. It is further added that the remedy is contraindicated in all diseases of the brain or spinal cord, as well as in any parenchymatous disturbance of the heart.

Ostertag (*Berlin. Tierarztl. Wochenschr.*, Jhrg. 4 and 5, Nos. 40 and 43) has likewise tested eseridin in horses and cattle, and has found that smaller doses than 3 to 4 grains, although producing increased peristalsis in these animals, in none did it produce diar-

rhæa, though Eber claims to have produced diarrhœa in the horse with 1½ grains. The employment of larger doses, such as 7½ to 8 grains, produced marked salivation, coughing, and disturbance of the circulatory organs, as well as symptoms of slight colic. Diarrhœa was produced in horses by a dose of 7½ grains, as compared with 12 grains of physostigmine required to produce the same effect; while, on the other hand, in cattle 9 grains were required as contrasted with 1½ grains of physostigmine.

A NEW THEORY OF DIABETES.

The theories in regard to the pathology of diabetes may be reduced to two. In one it is claimed that the glucose of the blood is not as completely consumed as in the normal state, and the feeling of chilliness experienced by diabetics is a fact which seems to substantiate this view. According to the other theory, it is supposed that the excess of glucose in the blood bears an exaggerated relationship to the sugar coming from the foods, thus constituting simple alimentary diabetes, which disappears with proper attention to the alimentation, or else it may be due to the superabundant production of hepatic sugar. The latter view offers an explanation of so-called nervous diabetes, in which antipyrin and opium will so often prove successful. Each of these two theories appears to be based upon a certain amount of truth, but they are both insufficient, since they will not explain all cases, especially of the so-called pancreatic diabetes. This species of diabetes, discovered by Lancereaux, is accompanied by complete atrophy of the pancreas, and only recently Von Mering has shown, as we have already alluded to in the GAZETTE, that complete ablation of the pancreas in the dog is followed by a more or less intense diabetes mellitus. It would seem, however, that this form of diabetes is not due to the interference with the entrance of the pancreatic juice into the intestine; for if only a fragment of the pancreas, even if separated from its duct, is preserved in connection with the solar plexus, the diabetes does not appear. Von Mering has offered no explanation of this fact; but in the *Lyon Médicale* for December 29, 1889, DR. LÉPINE suggests two possible hypotheses. In the first place, one may suppose that in the normal state a part of the pancreatic ferment is reabsorbed, and contributes to the destruction of glycogen, a supposition which is supported by the known action of the diastatic ferment of the pancreas. The following hypotheses, though less admissible, yet deserve consideration. It is well known that the contact of diastase with starch does not result in the formation of glucose, but of maltose. The diastatic ferments of the saliva and of the pancreatic juice, in contact with glycogen, furnish a sugar which is likewise identical with maltose. Mering is, however, of the belief that maltose, after contact with the pancreatic ferment, becomes converted into glucose. It results from these facts that the transformation of glycogen into glucose is much more complicated than is generally supposed, and requires the presence of the pancreatic ferment. If this ferment should be wanting, the hepatic sugar will not be normal glucose, but will be some other form of sugar which will not be capable of appropriation by the economy, but which will be eliminated by the kidney. Thus, in the normal state of health, the pancreas and the liver are both associated in the preparation of normal glucose. Whichever of these theories be adopted, pancreatic diabetes will, nevertheless, be a consequence of the failure of the pancreatic ferment, and diabetes will thus result from a relative reduction of the ferment in relation to the quantity of carbohydrates which are to be destroyed. Dr. Lépine promises in a subsequent communication to offer some new facts as to the demonstration of these theories, with their application to therapeutics.

PEREIRINE AS AN ADJUVANT TO QUININE IN MALARIA.

It is well known that in certain cases of malaria quinine seems to fail of its specific effect; the dose is steadily increased without any apparent effect on the disease, but frequently with only too obvious results on the heart and nervous system. The depression thus caused intensifies the adynamic condition caused by the fever, and the patient finally dies of exhaustion from what a poetical pathologist has called "febrile autophagism." In such cases digitalis combined with quinine is often useful, but, according to DR. F. TIBIRIÇÁ, pereirine (an extract of *Pao pereira* bark) meets the indications far more satisfactorily. He says it doubles the therapeutic activity of quinine, while at the same time preventing the untoward effects frequently produced when the drug is pushed. Pereirine, according to Dr. Tibiriçá, has no

depressant action on the heart, and, as he somewhat epigrammatically sums up the case, "ten decigrammes of quinine with ten decigrammes of pereirine are equal (in malaria) to twenty decigrammes of quinine," without the disadvantages of such a dose of the latter drug. He relates the case of an old woman, of 80, suffering from organic disease of the heart, and reduced almost to the last extremity of exhaustion by intermittent fever; quinine in considerable doses had no effect, but the temperature was brought down almost at once to the normal standard, and the appetite and strength speedily returned when pereirine was combined with the quinine. In several other cases Dr. Tibiriçá found the same plan of treatment equally successful.—*London Medical Recorder*, November 20, 1889.

THE ANTISEPSIS OF THE RENAL PASSAGES BY THE INTERNAL USE OF SALOL.

In the intestinal tube, as a consequence of the action of the pancreatic juice, salol splits up into carbolic and salicylic acids, which are then eliminated by the kidneys, carbolic acid without being changed, salicylic acid after combining with sodium. Investigations by Nencki, Sahli, and Lépine have proved the truth of this statement beyond contradiction, and these writers have, as a consequence, recommended its internal use in "internal disinfection" in cholera, typhoid fever, and other bacterial diseases. Dr. Dreyfuss (*Wiener Medizinische Blätter*, December 19, 1889), bearing these facts in mind, has recommended its use internally as a means of inducing the passage of an antiseptic fluid through the kidneys, ureters, bladder, and urethra; and claims that it acts in a much more intensive manner and covers a wider field than can be accomplished through the injection of antiseptic fluid. Sahli further has shown that the urine of patients who have taken salol internally is aseptic, and that salol in large doses is well borne and never produces toxic symptoms. It is, therefore, quite as suitable for producing antisepsis in the urinary passages as naphthol is for the antisepsis of the intestinal tract. Dreyfuss has employed salol, either alone or in composition with various balsamics, in blennorrhœa, the full dose varying from 75 to 120 grains. Even in acute cases, treated at the very outset, this mode of treatment rapidly diminished the secretion, and in some few cases arrested it within a few days. Its effects are especially marked in combination with the use of cubebs or copaiba.

Finally, Dreyfuss recommends this use of salol in operations upon the urinary organs, for in this way the urine is kept aseptic, and one source of danger is thus avoided.

PHENYL URETHAN.

Phenyl urethan is the name given to a substance obtained through the action of chloride of ethyl on aniline, which occurs in the form of a white powder; it is crystalline, insoluble in water and freely soluble in alcohol. The substance was introduced by Professor Giacomini in the Turin Academy of Medicine, where he stated that he had employed it as an antipyretic in seventy different cases suffering from various febrile affections.

His results, which are published in the *Journal de Médecine de Paris* for December 15, 1889, are as follows:

He found that phenyl urethan possessed marked antipyretic and analgesic properties, while at the same time exercising a beneficial influence on the general system. A dose of 7½ grains is said to be equal to 15 grains of antipyrin, and is capable of producing a fall of temperature of from two to five degrees, which may be maintained for from four to eight hours. The fall of temperature occurs within twenty to forty minutes after the administration of the drug, and is accompanied by no disagreeable after-effects. In acute articular rheumatism it is said to reduce pain and swelling. As an analgesic its results do not seem to have been such a success. In some cases it produced a favorable result, in others it was ineffective. The form recommended for its administration is as a solution in sherry wine, which is said to prevent collapse, cyanosis, and other unpleasant symptoms.

THE ADMINISTRATION OF PREPARATIONS OF IODINE AND BROMINE THROUGH THE RECTUM.

In the *Therapeutische Monatshefte* for November, 1889, Professor Köbener publishes an important paper as to the various indications and results which may be expected from the administration of salts of iodine and bromine by the rectum. He has employed this mode of medication for two separate purposes,—either in the treatment of local affections of the rectum or as a

means of treating constitutional conditions. The use of suppositories of iodide of potassium in the treatment of chronic inflammation of the prostate gland is by no means novel, though in many cases the pain produced by the friction, recommended by Schleiss, who introduced this process, is so severe as to prevent the proper performance of the operation.

Professor Köbener claims that the irritating effects of a solid suppository, even though combined with belladonna, may be largely overcome, and the desired effect obtained with greater certainty, through the employment of enemata of solutions of potassium iodide; or, in cases of chronic induration of the prostate, after a few days of the application of the iodide of potassium, pure tincture of iodine may be substituted for it with advantage, after gradually increasing the strength of the iodide of potassium solution from one and one-half per cent. solution up to thirty per cent., combined with an equal amount of potassium bromide. Of the pure tincture of iodine, 3 drops may be given at first for from three to six days, and the quantity then increased until each enema contains about 10 drops of the tincture, an amount which he found might be safely given. He found that this mode of treatment reduced the swelling and inflammation of the prostate gland, and decreased the catarrhal secretion of this gland and reduced vesical tenesmus. Even in cases of neglected inflammation of the prostate, the regular use of such enemata through a series of weeks served to produce great improvement in the condition. In syphilitic ulcers of the rectum, as well as in catarrh of the rectal mucous membrane after the use of astringent enemata, injections of solutions of iodide of potassium often proved of the greatest value. That iodide of potassium so administered is rapidly absorbed is proved by its speedy appearance in the saliva and urine of patients so treated. This observation thus shows that iodide of potassium may be administered through the rectum in cases where it is desired to affect constitutional conditions.

YELLOW OXIDE OF MERCURY SUBCUTANEOUSLY ADMINISTERED.

Dr. Chernoguboff has made a number of observations in the Miasnitski Hospital in Moscow in regard to the subcutaneous injections of the yellow oxide of mercury in connection with the treatment of syphilis, and has come to the following conclusions: 2-grain doses cause a quicker disappearance of all symptoms than smaller doses, reducing in ninety-two per cent. of cases the necessity for professional visits to one or two. In fresh cases an interval of ten or eleven days between the injections is sufficient to prevent salivation, but old cases require a longer interval. The injection should be made into the cellular tissue, and not into the muscles, to avoid the great pain in the case of the latter, and the frequent occurrence of abscesses. The treatment is said to cut short all symptoms, both when the disease is progressing and when it is on the decline; new spots, especially on the mucous membrane, are very rare. In tertiary syphilis, according to Dr. Chernoguboff, early gummata, and those which are breaking down, quickly disappear under the treatment; but in impetigo and rupia, iodide of potassium is often required in addition. Local applications do not usually accelerate a cure, except in sore-throat with papular infiltration of the tonsils, which requires heroic treatment. Relapse occurs, as in other methods, after two or four months. Men and women equally bear well large doses; children from 12 to 14 years require 1 grain only. The treatment is contraindicated in severe anæmia which has not been caused by the specific disease, in general exhaustion, undoubted alcoholism, chronic inflammation of parenchymatous organs, and in extensive dental caries; pregnancy is not a contraindication. Mercury is found in the urine in from four to eight hours after the injection. —*Lancet*, October 12, 1889.

TREATMENT OF MEDICAL EMERGENCIES.

The surgical emergency has been the subject of numerous addresses and papers, but the medical emergency has rarely, if ever, received systematic consideration. Yet the instances in which it demands treatment are scarcely less numerous than in the case of the former.

In the *University Medical Magazine* for January, 1890, Professor Tyson contributes a valuable paper as to the treatment of the more frequent medical emergencies, of which the following abstract represents the most important points:

Under the head of the treatment of medical emergencies, Dr. Tyson refers to the treatment of—*first*, syncope, or fainting; *second*, the apoplectic seizure; *third*, the con-

vulsion, whether caused by epilepsy, Bright's disease, peripheral irritation, or hysteria; *fourth*, lung hemorrhage; *fifth*, nasal hemorrhage; *sixth*, gastric and intestinal hemorrhage; and, *seventh*, asphyxia or suffocation.

1. In fainting, the heart does not cease to beat, unless it be fatal syncope, but its action becomes so feeble, and the quantity of blood sent out so small, that there is not enough sent to the brain to maintain consciousness.

The symptoms of fainting are, of course, familiar to every one. In the treatment of syncope, the first step is to place the patient in a recumbent position flat on the back, with the head low. The clothing should be loosened around the neck and body, the access of fresh air should be freely permitted, and to this end persons should be kept at a distance. Diffusible stimulants, as aromatic spirits of ammonia, and brandy or whiskey, should be administered, or strong ammonia may be inhaled. Cold water may be dashed in the face, the respiration being thus excited and in turn the heart caused to beat. If recovery ensue, the heart's beat becomes more distinct, the pulse reappears at the wrist, and consciousness slowly returns. It is only in cases where the heart is too badly damaged, as where there is fatty metamorphosis of its muscular fasciculi, or its valves are badly diseased, or where too much blood is drawn off, that resuscitation fails to take place.

2. The apoplectic seizure is a more dangerous condition. Accompanied, like fainting, by unconsciousness as an essential symptom, it is due to a very different cause. There is here too much blood in the brain, either within or without the blood-vessels. In treating it the patient requires to be bolstered up, the head high, and the blood kept out of the brain as much as possible. In the true apoplectic seizure, with even a moderately strong pulse, blood is to be taken from the arm freely, sixteen ounces or more. Simultaneously an aperient, which in the absence of consciousness must be one of which the dose is small, as 1/6 of a grain of elaterium in pill or powder, or a couple of drops of croton oil in a teaspoonful of sweet oil or glycerin. A large enema, to which an ounce of turpentine is added, is useful. Ice to the head—an ice-cap—may be of use. Of less service is counter-irritation to the nape of the neck or the temple by a blister.

3. There is no symptom more alarming than the convulsion. Beginning with a distortion of countenance, due to clonic muscular contraction of the face muscles, which rapidly invades the entire voluntary system, and is as promptly followed by unconsciousness, the victim mostly falls heavily to the floor, although he is sometimes warned by an aura which permits him to seek a place of safety. Serious injury and even death may be caused by the fall itself.

In treatment, the first steps are measures to prevent the biting of the tongue, which is, unfortunately, often too early a result to be averted, being caused by a primary and sudden closure of the jaw muscles. A piece of wood, a clothes-pin, or a cork secured so as to prevent its being swallowed, or a towel thrust into the mouth will answer the purpose. Then the patient's clothing is to be loosened, as in fainting, and he is to be restrained from such motion as may result in further injuring himself.

If the convulsion be due to epilepsy, nothing further can be done; if due to reflex irritation, as occurs in teething in children, or an overloaded stomach, the gums should be lanced in the former instance, and vomiting secured in the latter. The difficulty is to introduce the emetic; but irritation of the fauces by the fingers or a feather will frequently have the desired effect. Should the fit continue, a movement of the bowels should be brought about by an enema. In all cases in children, immediately after the cessation of the fit, if the bowels have not been moved during it, an aperient should be given to remove irritating matter in the alimentary canal, since this may avert a recurrence. Among such irritating matter are to be included the various intestinal worms.

If the convulsions are due to Bright's disease, a more active treatment is necessary. If it be puerperal nephritis, in addition to the measures taken to protect the tongue, the first step is undoubtedly to bleed from the arm, and, if the convulsions continue, chloroform should be inhaled. The same effect is often as well obtained by chloral.

Chloral is best administered by enema, and 60 grains may be thus given to an adult. If the convulsion is due to Bright's disease not occurring in pregnancy, a 1/4 of a grain of pilocarpine may be injected subcutaneously, and repeated in a few minutes if not followed by sweating; or, if this be not at hand, a hot-air bath or a steam bath.

Hysterical convulsion requires a different treatment. It is always less sudden than the epileptiform convulsion, is apt to be preceded by some premonitory symptom, such as a sense

of suffocation or extreme nervousness, but there is never any danger of the patient biting the tongue. Opisthotonos is usually the characteristic form of convulsion. As regards treatment, electricity in the shape of the direct galvanic current, occasionally interrupted, or of faradization, is, however, often felt, and will generally cause the convulsion to cease. Douching the patient with cold water will likewise be usually successful.

[Inhalations of nitrite of amyl will usually arrest convulsions, no matter what be their nature, though its use in puerperal convulsions after delivery may prove dangerous by producing flooding.—ED.]

4. Pulmonary hemorrhages are in the main confined to tubercular consumption, occur in two different stages of the disease, and have a very different significance. They may occur early, when the blood-vessels in the neighborhood of a tubercular infiltration, weakened by a tubercular deposit in their walls, yield to a distention from collateral hyperæmia. In such a case the hemorrhage is rarely large, and, so far from being harmful, is often a relief to a congestion producing dyspnœa and oppression. The greatest danger is the irritation and even inflammation which may be brought about by the presence of small coagula in the bronchioles and their insufflation into still pervious air vesicles. This danger escaped, the hemorrhage is harmless.

The second form of hemorrhage is much more serious. It occurs late in the disease, and is due to ulceration through the coats of a blood-vessel of considerable size, the vessel being either in the walls of a cavity or traversing it. Such a hemorrhage is dangerous, and not infrequently fatal. Prompt measures are, therefore, to be taken to relieve it. The thorax should be kept raised, and absolute quiet should be observed. This is further secured by a full dose of an opiate, if it be well borne by the patient. Of internal remedies, the time-honored one of common salt is of uncertain value; but, in the absence of anything else, may be swallowed, in the dose of a teaspoonful, repeated in a few minutes if the hemorrhage continues. Gallic acid, in 15-grain doses every ten or fifteen minutes, is a more rational measure, and should be substituted for the salt as soon as it can be obtained. Hypodermic injections of ergotin, in doses of 5 to 10 grains in water, may be given simultaneously, and should be repeated daily or twice daily where the tendency to hemorrhage continues. Their object is to bring about contraction in the blood-vessels. Other astringents, such as acetate of lead, in 3 grain doses, may be used under the same circumstances, as it would not be safe to use this drug in any quantity sufficient to bring about an immediate effect. The application of cold over the bleeding site is especially recommended by German clinicians, but one must be sure first of the situation, which is not always easily ascertained. Sometimes the patient is able to indicate it quite precisely, at others not. Sometimes auscultation may discover subcrepitation over the seat of hemorrhage. Cold should be applied in the shape of ice, in bladders or rubber-bags, so that the clothing shall not become damp, or of cloths wrung out in cold water. A more extreme measure, to be resorted to when others fail, is to throw a ligature around the larger limbs, cutting off the return of blood by the veins, while the outflow through the arteries is still permitted. Such a course will withdraw blood from the lungs and lessen the tendency to hemorrhage.

5. Hemorrhage of the stomach and bowels occurs usually in cirrhosis of the liver or typhoid fever. When treatment is required, tannic acid, in doses of 15 grains every ten or fifteen minutes, may be used, though even alum may be used, in the proportion of a teaspoonful to a glass of water, and taken in four doses, at short intervals.

Hemorrhages from the lower bowel, occurring frequently in typhoid fever, are much more serious. They are to be treated by quiet, cold compresses, or ice-bags, to the abdomen, and the use of foods of the most bland and unirritating nature. Tannic acid may be given as in hemorrhage from the stomach, large doses being much more apt to enter the bowels.

6. Nasal hemorrhage may be readily treated by snuffing up cold water, or a solution of alum in water, or injecting hot water into the nasal passages, and the use of ice externally. Of course, plugging the nares must be practised when all else fails.

7. The successful treatment of asphyxia depends upon the fact that the heart continues to beat long after respiration ceases, and upon this fact, too, depends the wonderful capacity for resuscitation which exists in those apparently drowned or otherwise apparently dead from suffocation. The first indication is, of course, to supply oxygen, the want of which is responsible for all the symptoms. If there is obstruction of the air-passages by a foreign body, it must be

removed, or tracheotomy must be performed. If the action of the muscles of respiration is interfered with, the interfering cause must be removed. If the patient is in an atmosphere of scanty oxygen or of irrespirable gases, he must be removed to fresh open air. In slighter degrees of asphyxia, such as are seen in the new-born infant, slapping the face with the bare hand or with a wet towel, or dashing cold water upon it, will often have the effect of exciting the breathing act and of aërating the blood. If these measures are insufficient, then artificial respiration must be practised by some one of the usual methods, as that of Sylvester or Marshall Hall. In apparent drowning, faradization or galvanism of the phrenic nerve may be used, especially one pole being placed over the nerve as it crosses the scalenus muscle at the root of the neck, and the other at the epigastrium.

THE INJECTION TREATMENT OF ACUTE GONORRHŒA.

Dr. Friedheim, writing from Neisser's clinic upon the above subject, in the *Archiv für Dermat. und Syph.*, No. 4, 1889 (*Journal of Cutaneous and Venereal Diseases*, January, 1890), gives the results of a series of experiments carried out to determine the relative destructive powers possessed by a great variety of different local remedies against the gonococcus, as well as their influence upon the inflammatory condition, and their efficacy in causing desquamation of the urethral epithelium, and through the latter a mechanical elimination of the microbes. In twenty-nine cases corrosive sublimate was employed (1–10,000 to 1–15,000). In fourteen, treatment had to be intermitted because of the pain, difficult urination, bloody urine, œdema, or other ill effect, while in eleven instances this treatment had to be stopped altogether. In a second series of twenty-nine cases, injections of 1–20,000 were used without necessitating any interruption, though some pain was caused by them. An addition of salt in a tenfold quantity caused a decrease in the irritant symptoms, but at the same time in the antibacterial effect. In the first series the gonococci were decidedly influenced in ten out of the fifteen cases in which treatment was continued, while in the second twenty-nine cases this influence was noted sixteen times.

As regards the rapidity of antibacterial effect, no remedy produced more rapid destruction of gonococci superficially situated than 1–30,000 sublimate solution, which caused their disappearance from the secretion, in many cases, after four days' treatment, and often after a week they remained absent. In weak solutions this remedy acts as an astringent, and in strong solutions as a caustic, and only produces desquamation where irritation enough has been set up to produce shedding of a whole layer of epithelium.

In another series of twenty-nine cases the salicylate of mercury (1 in 270) was tried, and gave twenty two positive results, so far as antibacterial effect was concerned, and was found but slightly irritating. Its action is somewhat slower than the sublimate, but more sure and lasting. Zinc, lead, and tannin were employed in a large number of cases without any positive antibacterial results.

Bismuth subnitrate and salicylate, in from one-half to ten per cent., were employed in twenty-six instances, with six positive antibacterial results.

Permanganate of potassium (1–3000 to 1–5000), tested in seventeen cases, showed also six times a decided influence upon the gonococci. In stronger concentration an unpleasant irritative action was noted. The discharge was rendered decidedly thinner, and the number of pus-corpuscles was decreased, but no great desquamation of epithelium was observed.

Resorcin, in from two to four per cent. solution, in twenty-two cases, was found to have no great antibacterial or desquamative influence, but was exceptionally well borne.

Salicylate of sodium (five to twenty per cent.), in twenty-six cases, showed slight effect on the gonococci, with only five positive results.

Antipyrin (three to six per cent.), in twenty cases, was found to exert but little influence on the cocci, giving but three positive results. Boric acid was equally devoid of antibacterial power.

Naphthol (1–1000 to 1–100), in twenty cases, showed but two results favorable to this drug as a destroyer of the gonococci. Carbolized lime-water (acid. carbol., 1; aq. calc., aq. dest., āā 50) gave four positive out of twelve trials, and, though without marked antibacterial virtues, was, however, found to be astringent and productive of marked desquamation.

Thallin sulphate was used, in five per cent. solution, sixteen times, with three antibacterial results, and in seven per cent. suspen-

sion ten times, with five successful results. The tartrate of equal strength, in eleven cases, each gave two positive results for the weaker and six for the stronger solution.

And now we come to the most important portion of the paper,—that relating to the observation upon *nitrate of silver* injections, which have for a number of years been used in Neisser's clinic. Three hundred and eighteen cases were treated with this salt; examination showed that in two hundred and thirty-seven of them an antibacterial effect was produced, and the failures were attributed to inattention on the part of the patients, who were treated in dispensary practice, etc.

Nitrate of silver increases the inflammation when used in strong concentration, but when in proper dilution decreases it, and at the same time a decrease is noted in the number of gonococci. In the Neisser clinic the treatment of acute gonorrhœa is begun at once with injections of silver, in concentration of 1–4000, or, at most, 1–2000, and, in spite of all attempts to find a better remedy, there must be accorded to this one the undisputed first place, even ahead of corrosive sublimate. In the first few days the discharge becomes richer, thicker, and more purulent, but after about four days the secretion becomes less, thinner, whiter, and contains more epithelium. The gonococci decrease materially in quantity, and may in a few days more disappear completely. The injections are made four to six times daily at first, and gradually decreased to one per diem, and this is best to continue for several weeks. In some individuals even weak injections (1–5000) will not be well borne, and boric or antipyrin injections will have to be made before or after the silver, sitz baths and suppositories used, or the drug be given up entirely. In case of complications arising, the use of local remedies is not stopped at this clinic, as is usually the case, but antiparasitic injections are continued, especially in epididymitis. Complications are prevented in a measure, it is believed, by the antibacterial methods of treatment. Thus, it is seen, that out of twelve hundred cases of gonorrhœa, epididymitis was present but one hundred and sixty-four times, funiculitis being noted in twenty-seven instances. Twenty-two times only did the epididymitis appear during treatment, and only once did it develop in the whole number of cases treated by nitrate of silver injections. In the remaining one hundred and forty two cases the complications were present before treatment was begun. Other complications, such as bubo, prostatitis, cystitis, etc., if present at all, were so prior to treatment.

Microscopical control is imperative in carrying out this therapy in a rational manner.

PATHOLOGY OF DUODENITIS AFTER BURNS.

At the meeting of the Pathological Society of London, held January 7, 1890, Dr. Hunter read a communication on the "Pathology of Duodenitis after Burns" (*Lancet*, January 11, 1890). After referring to Mr. Curling's observations, made in 1842 in a paper read before the Royal Medical and Chirurgical Society, in which he recorded ten cases of ulceration of the duodenum after burns, he said that there had come to be a widespread belief in the existence of some connection between injury to the skin and affection of the duodenum, but up to the present time no satisfactory explanation of its nature had been given. Mr. Curling's view that the ulceration of the duodenum resulted from the augmented action of Brunner's glands did not rest on any physiological basis, and the same remark applied to the theory of Drs. Brown-Séquard and Handfield Jones that the lesion was due to sympathetic disturbance. Reports from Dr. Wilks, at Guy's Hospital, and from Mr. Macarthy, at the London Hospital, were valuable in showing the rarity of duodenal ulceration after burns. The object of the present communication was to show that a connection existed between duodenal lesion and burns, and to give a reasonable explanation of its nature. The results of certain experiments on dogs were recorded, and they were obtained in the course of other investigations involving the study of the behavior of certain poisons on the blood and the channels of their elimination from the body. The drug employed was toluylendiamin; it was administered subcutaneously in doses of from .3 to .5 gramme, and the animals were killed from three to seven days later. The fact established by these observations was that the most intense duodenitis might be set up by the excretion of irritant products through the bile. This would explain not only duodenitis after burns, but also other allied conditions. A dog killed seven days after the subcutaneous injection of .5 gramme of toluylendiamin, the administration being repeated on the fourth day, showed a normal empty stom-

ach, while the duodenum for a distance of eight inches from the pylorus presented the most marked evidences of inflammatory change; the lumen of the gut being filled with clear mucus derived from the inflamed area. The congestion was greatest in the neighborhood of the openings of the bile-ducts, and gradually faded away from that point downward. The whole intestinal mucous membrane was somewhat swollen, and presented patchy congestion. In another experiment, in which the animal was killed three days after the administration of .3 gramme, there was, in addition to inflammatory congestion, what seemed to be commencing ulceration; but it was found that no actual loss of tissue had occurred, these spots being simply follicular tissue with considerable swelling of the mucous membrane around their margins. In this case there was also much injection of the lower portion of the ileum, which appeared to be due to stagnation of bile-stained fluid in this position. Other experiments gave similar results. In all the cases the only channels by which the poison reached the intestine was through the bile, but whether it was the drug itself which produced the lesion or some products of its own disintegration or of its action on the tissues was not at present determined. The duodenitis thus produced experimentally strikingly resembled that met with experimentally after burns, there being in both inflammatory congestion of the mucous membrane, with or without ulceration, or an appearance like it. The congestion would probably usually pass off in the course of a few days, its longest duration being about seven; while an ulcer formed during this period would be prevented from healing, and later (probably in about two or three weeks) would cause death by eating through the intestinal coats and opening one of the branches of the pancreatico-duodenal artery. Of the tissue changes produced by extensive burns, or the products of those changes, almost nothing was known; but changes in the blood-corpuscles had been frequently observed, and hæmoglobinuria had been often noticed; this, though doubtless in part due to the high temperature, was more directly owing to the action of the products formed from the disintegration of the burnt tissues. To complete the parallel drawn between the action of the products thrown into the blood after burns and toluylendiamin, it was only necessary to add that one of the most marked properties possessed by the latter drug was its power of inducing destruction of the red blood-corpuscles. Though it was necessary to be careful in transferring the results obtained from experiments on animals directly to the case of man, yet it was impossible to overlook the striking resemblance between the lesions induced in the duodenum and the action on the blood in the two sets of cases; and the logical conclusion followed that the cause of the duodenitis of burns, as of the duodenitis of toluylendiamin poisoning, was the excretion of substances irritant in their action through the bile.

THE ANTISEPTIC PROPERTIES OF LIME.

According to the Paris correspondent of the *New York Medical Record* (January 4, 1890), Drs. Richard and Chantemesse have made a series of experiments, published in the *Revue d'Hygiène*, relative to the antiseptic properties attributed to lime against the typhoidic bacillus and the cholera bacillus. According to these experiments, a solution of lime of the consistence of milk possesses properties superior to those of the chloride of lime and of corrosive sublimate, in the proportion in which they are habitually employed. The authors have disinfected fæcal matters with this solution of lime, but only fæcal matters in a liquid form can be so treated. When it is necessary to disinfect a cesspool in which the dejections of typhoid, choleraic, or dysenteric patients have been emptied, it is sufficient to pour a solution of lime into the cesspool. If the matters in it are in a state of putrefaction, it would be necessary to wait until, in the first instance, the ammonia which the lime displaces from its saline combinations be disengaged, and in the next, until a portion of the lime be thus lost by disinfection. The liquid should be stirred with a wooden stick in order to facilitate the escape of the ammonia, and to render the mixture homogeneous.

PAPAIN IN EAR-DISEASES.

Papain has been very considerably employed to remove the false membrane in diphtheria, while various writers have recommended it as a dressing in syphilitic and other ulcers, and it has been employed with some success for cleansing the recesses of the middle ear after mastoid operations. It occurred to Dr. R. McKenzie Johnston (*Edinburgh Medical Journal*, January, 1890) that it might be of use in chronic suppuration of the

middle ear. In such affections pain is a certain indication that the secretion is not getting away very freely, a condition which may be due either to the smallness of the perforation, the viscidity of the pulse, or caking of cholesterin or wax. It is well known that if these conditions are neglected that the retained septic pus may lead to an extension of disease, possibly necessitating an operation for mastoid abscess or even for cerebral abscess. It is evident that anything that can insure the cleansing of the middle ear, and that can readily dissolve hard masses of *débris*, etc., must of necessity decrease the risk of these serious consequences. Dr. Johnston states that he has used papain in a number of cases where syringing was insufficient to accomplish the desired result, and in all cases his experience has been most satisfactory. His method of employing the drug is to drop 15 minims of a five per cent. solution into the ear, care being taken that it reaches the bottom of the meatus. If necessary, the patient should be made to swallow while holding the nose, so as to draw the fluid into the middle ear. After allowing it to remain an hour, the ear is syringed out, and care taken to prevent the development of bacteria by the use of boracic acid. This plan of treatment seems to be especially suitable where there is a long-standing case, and only a little thin and very foul smelling discharge, probably associated with some diseased bone. It also may be used successfully where there is no perforation, but where a firm plug of wax and epithelium has caked together, and could not be dislodged by syringing. Dr. Johnston states that at first he used the papain in simple solution, either in water or camphor-water, but afterwards he was inclined to think it acted better with the addition of some soda, so he now uses five grains of the bicarbonate of sodium to the half ounce of papain solution.

TRACHEAL INJECTIONS IN PNEUMONIA.

At the meeting of the Société de Biologie, held January 4, 1890, M. PIGNOL stated that he had made use of solutions of naphthol, in the proportion of 2 parts to 1000 of water, injecting about 8 ounces of this solution into the trachea at one sitting (*La Tribune Médicale*, January 9, 1890). He also claims that these injections are perfectly well tolerated, that immediately after their employment the patients appreciate a diminution in the dyspnœa, and in one case there was marked reduction of the fever, while there is always evidence of an improvement in the physical condition of the lungs. His method of employment is to puncture the trachea by means of the needle of the hypodermic syringe, and then allow the solution of naphthol to flow through this needle drop by drop for half an hour.

In the discussion which took place after the reading of this paper, M. DUVAL called attention to the fact that Cl. Bernard had noted the extreme power possessed by the trachea in absorbing drugs, and that he had made use of this mucous membrane for administering the sulphate of quinine.

M. GELLÉ called attention to the fact that laryngologists made use of the power of absorption possessed by the larynx in the administration of the oil of menthol.

ALUM ENEMATA IN DYSENTERY.

In the *Lancet* for January 11, 1890, DR. HENRY F. NORBURY publishes a case of a seaman, aged 31, who had contracted dysentery abroad three years and a half previously, and since that time had never enjoyed his usual health. He had frequently suffered from tormina, had from three to ten loose offensive stools daily, accompanied by much tenesmus and by occasional passages of blood, and he had gradually become feeble and emaciated. During this long period he had frequently been under treatment, but with only slight benefit. He was unable to continue his duties on board ship, and had to return to England, when he came under Dr. Norbury's observation. His appetite was bad, his tongue foul; he passed, amid much straining, from three to eight loose, frothy, offensive motions daily, sometimes containing blood; but, although griping pains were often very distressing, there was neither tympanites nor abdominal tenderness. He was carefully dieted, and among the drugs prescribed for a long period were compound ipecacuanha powder, aromatic sulphuric acid, decoction of hæmatoxylon, lead pill with opium, compound kino powder, chlorodyne, sulphate of copper pill with opium, and liquor ferri pernitratis, besides enemata of opium, of nitrate of silver, and of sulphate of zinc, and suppositories of tannin, but he seemed to derive no benefit whatever from any of the

above. Lastly, an enemata was prescribed containing half an ounce of alum in ten ounces of water, to be administered night and morning. It produced slight sweating at first, but the effect in a couple of days was remarkable; the stools were reduced to one or two daily, and shortly became of natural consistence. This treatment was continued for eighteen days, when the patient expressed himself as feeling better than he had done for years; he had also gained considerably in weight and looked robust. He was kept under observation for some days after the enemata were stopped, to ascertain if there would be any return of his complaint, but as there was none he resumed his ordinary avocations.

CHLORIDE OF SODIUM IN FACIAL NEURALGIA.

In the *Edinburgh Medical Journal* for January, 1890, MR. GEORGE LESLIE claims that nearly every case of facial neuralgia, toothache, and earache, as well as neuralgic headaches, may be cured by the application of powdered chloride of sodium, common table-salt, to the nasal mucous membrane. The salt may be used by the patient as a snuff, a pinch being taken into the nostrils of the affected side, or it may be applied by means of the insufflator. If we examine the list of cases which Mr. Leslie reports, three of supra-orbital neuralgia, five of toothache, three of facial neuralgia, three of nervous headache, one of neuralgia following herpes, one of neuralgia accompanying glossitis, cephalalgia accompanying tonsillitis, and one of bronchial asthma, it would appear that chloride of sodium possesses unsuspected properties as a universal panacea. We are naturally inclined to be sceptical as to the properties of a remedy for which so much is claimed, though it is possible that there may be a good deal of truth in Mr. Leslie's claims for common salt.

SACCHARIN IN CYSTITIS.

It was recently stated that a writer in the *New York Medical Record* had found the administration of saccharin extremely useful in correcting the offensive odor of ammoniacal urine. The affection is so distressing, often embittering the last years of life, that it will be interesting to draw attention to a similar observation, but of earlier date, which was published by DR. JAMES LITTLE, of Dublin, in the *Transactions of the Royal Academy of Medicine in Ireland.* The paper was read in April, 1888, more than a year before the note appeared in our esteemed American contemporary. Dr. Little's cases are so interesting that they may be quoted. The first was that of an old lady, aged 80, with purulent ammoniacal urine; she had passed phosphatic calculi, and the bladder probably contained many others, but the patient refused any surgical interference beyond the occasional introduction of a soft catheter and the washing out of the bladder by the lady who acted as nurse. "Quinine and boric acid," Dr. Little continues, "when taken in fair doses, always purified the urine, but about three months ago her stomach became so irritable that these drugs could not be borne, and the washing out of the bladder by a weak warm sublimate solution could no longer be practised, as the passage of the catheter had become exquisitely painful. The consequence was that the urine became so offensive that the odor met one on the stairs, and the patient's attendants had often to leave the room to avoid being sick. In this difficulty it occurred to me to try saccharin. I directed six of the tabloids to be used daily. In three or four days the urine was no longer offensive. The patient has continued their use ever since, and the urine has not again become ammoniacal, though there is little, if any, diminution in the quantity of contained pus. Since the foregoing case came under my observation, I have had four other opportunities of observing the effect of saccharin in patients who were passing ammoniacal urine. They were all males: one a case of catarrh of the bladder, in a paraplegic gentleman; one a case of chronic cystitis, with enlarged prostate; and two cases, in which there had existed stricture of the urethra, but in which, although a surgeon had successfully dilated the stricture, the urine remained ammoniacal. In all these cases the saccharin was distinctly useful, but in all its administration had been combined with the daily use, by the patient himself, of a catheter, so as to prevent the accumulation of residual urine in the bladder,—a precaution without which no drug will, I think, prevent decomposition of the urine."—*British Medical Journal*, January 11, 1890.

Reviews.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. Vol. III., No. 3. Published monthly. September, 1889. New York: William Wood & Co., 1889.

This number contains five monographs. The first, on "Congestive Neurasthenia, or Nerve Depression," by E. G. Whittle, M.D., is a plea for blood-letting, as a means of cure, in a class of cases which, to the modern medical mind, are far from suggesting such an agent. Forced-feeding, massage, rest, these are the means which are now employed in neurasthenic cases, and the author cites many cases to show that they correspond to the neurasthenic type in all important particulars. Nevertheless, he discriminates from the mass of such cases, many which he considers as fit for his peculiar plan, and draws blood by leeches with, as his cited cases show, the most remarkable and permanent results. True, a relapse follows often the first withdrawal of blood, but a repetition of the remedy once or more times will secure a lasting cure. While many readers may be sceptical, it seems to us that the author's advice is worth trying.

"The Art of Embalming," by Benj. Ward Richardson, M.D., is a very interesting paper, and is an epitome of general information on the subject. It is simple, but practical, and any medical man, by following its directions, can embalm, if emergency require, well enough for all ordinary purposes.

"The Etiology, Diagnosis, and Treatment of Phthisis," by Dr. H. von Ziemssen, gives us another valuable study of a disease, which, from its wide prevalence, its steady mortality, and from our newly-discovered partial knowledge, is of intense interest to the physician, since we have seemed for some time past to be, perhaps, on the very verge of further discovery which may modify entirely our treatment and its results.

Dr. C. Lloyd Tuckey's monograph on "Psycho-Therapeutics; or, Treatment by Hypnotism," will prove welcome to the many who are just now experiencing a renewed interest in the subject. How long it has taken to arouse this interest is a surprising matter to the thinker. But by no means so surprising as the subject itself, which, as the reader will find out if he peruse Dr. Tuckey's work, has now been brought into a better shape than ever before, thanks to the quiet but continuous labors of Charcot, Braid, Tiebault, and others. How far behind the rest of the world we are in this matter may be shown by the author's statement that in Holland "in every large town it (psycho-therapeutics) is followed by at least one well-qualified practitioner." In fact, the field opened by recent research seems in some directions almost boundless, and it is time that more attention was paid to it in America. The author's statistics, giving the general results of hypnotization, will be a surprise to those not familiar with recent observation. Of the patients submitted to hypnotization by Dr. Tiebault in 1880, out of one thousand and fourteen in all, only twenty-seven failed to be influenced, while the remainder succumbed more or less completely. Children and adults were equally susceptible, as another table shows; in fact, under 14 years, all the patients submitted were influenced. And these numbers hold equally good in the practice of others, and in towns not so exclusively "pervaded by an atmosphere of hypnotism and suggestion" as Nancy.

The author's most interesting chapter, however, deals with suggestion and post-hypnotic suggestion, for by these means are attained the many cures claimed by hypnotism. Here the field seems boundless in its possibilities. If we are to believe enthusiastic advocates, all the badness of humanity is to be changed; the root of evil is struck. "Out of the heart proceed," the sacred book tells us, all our crimes, and by hypnotic suggestion the fountain is cleansed, and the hypnotized are told hereafter to "think only the thing which is good." The inebriate is told to loathe alcohol, and he loathes it when awakened, and, we are led to believe, for a long time afterwards. Whether the liar will loathe lying, and the impure become virtuous, we wait to learn. For a numerous class of cases we conceive the suggestion to be of vast value,—viz., those weak-nerved people who are forever irritated and jarred by the unavoidable things in life. The dwellers on the lines of elevated roads can be hypnotized, and told that hereafter the rumble of the passing train will be to him as sweet music. The unfortunate who dwells next to a stamping-mill will be able to enjoy the hammering, and in a coming age, a doubtful monarch, if there be any monarchs, will be submitted to the suggestions of the wisest and most virtuous hypnotizer of the realm before ascending the throne. Yet, seriously, humanity instinctively shrinks back appalled at the whole matter, for where hereafter is the bold, determined ego,—the man himself with his

firm will and consequent responsibilities,—if these things be true? Where is moral responsibility, and where the struggle to do right, and its reward when successful, where the elevation and building up of character, if by a sleep it is all gone, and we think other people's thoughts and follow without reasoning, or resistance another's suggestion? That there is some character left one observer shows us, for he says that subjects often strenuously object to doing things that they think wrong, but they do them; and, lastly, from a theological point of view, if we can so easily put good suggestions, let us say, into a previously evil mind, why has not an all-powerful Creator done the same for us, and saved us from crime and sin and its consequent misery? In fact, the subject of hypnotism in all its bearings is too fast for contemplation. Yet its actuality is so great that we are forced to study it, and utilize it to the utmost of our ability, and how far it has been utilized, and to what good purpose in the treatment of disease, may be learned from the pages of Dr. Tuckey's monograph.

The last article in this volume is on "Sexual Activity, and the Critical Period in Man and Woman," by Dr. Louis de Séré. In this article the author tries to prove that the "change of life" is just as real in man as in woman, though it occurs some years later. He has made out quite a strong case, and has collected numerous valuable observations, and from them has drawn some very useful deductions. E. W. W.

THE EVIL THAT HAS BEEN SAID OF DOCTORS. Extracts from early writers. Collated from "Le Mal Qu'on a dit des Medecus" of Dr. S. J. Witkoski. Translated, with annotations, by T. C. Minor, M.D. Cincinnati: Reprint from *Lancet-Clinic*, 1889.

These be "extracts." But who knows what dreadful sayings of the past the translator has wisely left unextracted, and what good purpose, we would ask, is served by the extracts given us? Who would like all the evil things ever said about him by any one, anywhere, all collected and presented for his perusal? The reading might be salutary, but how bitter. Since, however, the translator has thought good to bring these "evil things" to our notice, and evidently intends us to consider the extracts he makes as representative of all the evil things ever collected, we have read them, and can only say that the task was disagreeable. The wit that pointed what it considered as envenomed shafts at our noble profession was a very poor, stale wit. The same old jokes—mostly excrementitious—seem to have reappeared in every age. The same very small idea of what the profession was and is seems to have always existed, and we think, yes, are sure, that we could say much more evil-pointed and true things about the profession ourselves, if we chose. So, perhaps, antiquity has let us off easily after all, if only antiquity could have had a cleaner tongue and pen.

E. W. W.

LECTURES ON OBSTETRIC NURSING. Delivered at the Training-School for Nurses of the Philadelphia Hospital by Theophilus Parvin, M.D., Professor of Obstetrics and Diseases of Women and Children at Jefferson Medical College, etc.
Philadelphia: P. Blakiston, Son & Co., 1889.

In the blinding Sahara of manuals the tired reader will rest and be refreshed when he comes to this one, albeit it be small and unpretentious, and there lie around him a hundred larger, weightier, and more labored ones,—manuals of obstetric nursing which reveal the whole science and art to its most recent discovery. Here at last the nurse who seeks to know her business, and not some other business, can read and mark and inwardly digest. Trained by such lectures, she may thrive and grow and burst into modest bloom, where on the weightier pabulum so often offered her she wastes and withers, or is forced into some strange exotic growth, which ill-befits the modest flower she should be. Here is just enough knowledge to make her wise in her station; just enough antisepsis taught to make her safe for herself and her clients; just enough lying-in-room tradition to show that she follows the calling of the wise woman; and yet she will be no blind believer in old tradition, for she will learn at least that nipples cannot be made more elastic by the longest course of alum and brandy. Many other things, too, she may learn which will never bring her knowledge in conflict with the physician,—viz., that the Spartan infants were washed in wine, and that some early Christians—Anglican—were baptized in the same generous fluid. She will also, when her patient seems to be suffering intensely, console herself by the story of the heroic Roman wife, who gave "no whisper of a groan" lest she should reveal her husband's hiding-place. She can also recall at such a moment the endurance of the Lacedæmonian boys, who suffered foxes to tear their bowels in grim silence. She will also retain, if of naturally retentive memory, such Latin phrases as "In Hoc Signo Vinco," and others

which she will meet with in these pages. She will know of Pascal's remark concerning the nose of Cleopatra, and can memorize some choice lines of old English poetry for her solace, if she be plain of feature. She will know enough to thank heaven that she was not by unhappy misplacement a *garde d'accouchées* of the eighteenth century in Paris, but only a faithful, modest, and well-trained nurse in these United States towards the close of the nineteenth century. Art, to a certain extent, will be familiar to her ear, if not her eye. With Lucretius and Ruskin, Milton, Sir Walter Scott, Robert Burns, and Dante she will possess some slight familiarity, not enough to breed contempt. And even such classic names as Æschylus and Sophocles will not excite in the future any unmannerly surprise, nor will her breath be perfumed with onions and whiskey, or her gown untidy; in short, if she follows Dr. Parvin's admonitions and instructions she will be a very desirable nurse. E. W. W.

A HAND-BOOK OF PATHOLOGICAL ANATOMY AND HISTOLOGY. By Francis Delafield, M.D., and T. Mitchell Prudden, M.D. Third edition.
New York: William Wood & Co., 1889.

In considering the volume before us, the evident, as well as expressed, aim of the authors to produce a thoroughly *practical* book must be distinctly borne in mind; that a very gratifying share of success has attended their efforts is evidenced by an appreciation necessitating the appearance of a third edition. To those whose early medical training was completed before the doctrines and methods of modern pathology received the careful attention and consideration that our medical schools are now beginning to so justly accord them, this hand-book is especially useful, since the information it contains is precisely that most needed by those who propose to become personally acquainted with practical pathology.

The book is divided into four parts. The first part relates to autopsies and to the preservation of tissues. Taking up the several regions of the body, the examination of the organs is concisely described, and many little expedients, so valuable in overcoming unexpected difficulties, are suggested. An excellent feature of this section is the explicit directions for preserving tissues for microscopical examination, which follow the consideration of each organ. While always selecting the simplest method promising good results, the authors do not hesitate to insist on the use of the less common and more expensive reagents when necessary for really satisfactory work. If the evident, but so seldom fully appreciated, importance of placing tissues at once, and with little handling, into an adequate quantity of preserving fluid could be impressed upon every young pathologist, the loss of not a few interesting specimens would be avoided.

Passing to the second part,—embracing the pathology of the blood, degenerations, animal and vegetal parasites, inflammation, and tumors,—one naturally turns to the pages devoted to that subject which has assumed such importance during the last few years,—the bacteria. The morphology of the three cardinal types is sketched and illustrated by a number of well-known forms, following which the main features of the technique of bacterial investigation are indicated. In view of the aim of the book,—to offer efficient aid to those isolated students to whom personal instruction is often inaccessible,—it seems desirable that the directions for work in this important field should have included more of the minutiæ as to the manipulations, and especially that the most frequent sources of failure and their remedies should have been added. In this relation, however, it must be admitted, as the authors observe, "It is wiser for one purposing to carry on bacterial researches to gain a practical acquaintance with methods and apparatus in a well-appointed laboratory than to attempt to work out the methods from books." Again, "A large experience in this sort of manipulation is necessary before reliable results can be obtained in original investigation, since the slightest error or carelessness in manipulation, or failure to observe the occurrence of contamination, is likely to entirely vitiate the results of long series of experiments," is a truth that cannot be too strongly emphasized, a due appreciation of which would lighten an already heavily-laden literature of a burden of misleading contributions.

Part III.—treating of the morbid anatomy of the organs—occupies, naturally, the greater portion of the book, and contains many admirable drawings of diseased tissues.

The fourth and final part includes the lesions found in general diseases, in poisoning and in violent deaths, and presents a striking contrast to the pathology of ten years ago in the presentation of the pathogenic bacteria. The microbes found in connection with typhoid fever, relapsing fever, diphtheria, cholera, tuberculosis, erysipelas, pyæmia, anthrax, and leprosy are figured, to which are added sketches of the plasmodium malariæ.

While concise of necessity, from the vast field covered by the work, the matter presented is systematically arranged, and contains the salient points of the subjects discussed, while the frequent bibliographical references indicate the sources for further and fuller information for those especially interested. The illustrations form another pleasing feature; to meet over two hundred illustrations drawn by the author is, indeed, a refreshing experience. What some of the figures, notably those colored, may lack in artistic merit, is more than offset by the many admirable representations of pathological conditions, and by the thoroughly conscientious endeavors of the authors to represent nature rather than to produce a pretty book.

The authors have wisely contented themselves with giving only reliable and thoroughly tried technical methods, refraining from presenting an array of formulæ which only confuse and distract the beginner when left to his own choice. While having little sympathy with those epitomes in which all life and interest are squeezed out in the condensation of bare facts, the present book merits much praise. Without undertaking to supplant the larger exhaustive treatises, it is doing a good missionary work for pathology by enlisting the interest of men who would never turn from their busy routine to read the more pretentious volumes.

ON DISORDERED DIGESTION AND DYSPEPSIA. By Frank Woodbury, A.M., M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1889.

This is another of the Leisure Library Series, and will be found very readable and instructive, especially the section on gastric fermentation, acetic, butyric, etc., and its relief, since these cases are always presenting themselves, and furnish the great army of hypochondriacs with the largest and most persistent recruits. E. W. W.

PHYSICIAN'S LEISURE LIBRARY. THE MODERN TREATMENT OF DISEASES OF THE KIDNEY. By Professor Dujardin-Beaumetz. Translated from the fifth French edition by E. P. Hurd, M.D.
Detroit, Mich.: Geo. S. Davis, 1888.

Though this little work has been for some time before the public, it will not be amiss to again call attention to the series of which it is a valuable member. Perhaps, for its price, it represents more in readability, clearness, modern views, and general therapeutic value than any book of the kind easily accessible. The most hardened routinest in practice will find points of value which are novel to him, and the book is so comprehensive that one learns from its perusal a definite scheme of kidney-disease and its treatment, which is more than can be claimed for more expensive and elaborate monographs on the subject.
E. W. W.

Correspondence.

PARIS.

(From our Special Correspondent.)

The End of Influenza—Elder-Bark a Mild Emeto-Cathartic—What becomes of Alkaloids in Seeds?—Calomel outside and Iodides inside Incompatible—Urobilin a Symptom of Hepatic Lesion—A Medico-Legal Museum.

Influenza has come and gone,—or nearly so,—after doing in a short time considerable damage. When the epidemic first appeared the faculty made light of it, even the Academy of Medicine assuring the population that the visitation would be a harmless one, comparatively. Only one member, Dr. Ollivier, raised his voice in warning, but he was not heeded, some say because he is given to croaking. And now the supposed inoffensive "grippe" turns out to have been in Paris worse than either of the three cholera epidemics of 1854, 1865, and 1884. As a consolation, Parisians are told it is not the influenza that kills, but its sequelæ, such as bronchitis, pneumonia, and other lung affections. "Many thanks," they reply, "and much good it is to us!" At the same time they took kindly to the disease, merely calling it by the Anglo-Italian term, "influenza," instead of the French name, *grippe;* but there was no excitement or panic and no stampede, such as occurred in 1884, at the time of the last very mild cholera epidemic, which shows that sometimes there is much in a name. America, we have been informed, has also been sorely tried by the unwelcome visitor, not long after us, and consequently knows how it is herself. For one thing, there also an interchange of names has taken place, American papers apparently preferring the term grippe to influenza. Well, there is no harm. The first word is said to be of Germanic origin,* and anyway makes good Anglo-Saxon. Only it is a barbarism to say, as the New York *World* recently did, "Monsieur la

* Some, however, give it a Latin etymology,—namely, *corripere*, gripper, to grip.

Grippe." Give her the madame by all means! Although the disease may have been unpleasantly familiar on your side of the Atlantic, yet it may be instructive, if only to compare notes, to relate what the experience has been in this city, especially as the data have been carefully collected, and, as a rule, differ but little from what occurred in other parts of the country. The following observations have been made. As regards age, children were scarcely affected, while for persons from 20 to 60 years the deaths numbered three times the average, and over 60 years only twice. Both sexes have not fared alike, more adult males having died than females, in the proportion of 772 to 415 during the last week of December. The ratio is said to have been reversed near the end, but men will remain in the majority. Wealth has conferred no privilege; mortality has been the same for the rich and the poor. Only the army in actual service has enjoyed remarkable immunity. Now, to scan the immediate causes of death. During the last week of December only 22 cases were credited to influenza proper, while 742 were charged to inflammatory diseases of the respiratory organs, against 207 during the same period the year previous. Pneumonia, the most deadly, 346 against 67 (21 only in summer); bronchopneumonia, 138, instead of 64 (10 in summer); acute bronchitis, 132, against 60; chronic bronchitis, 127 to 46; and phthisis, 421 to 206. The last carried off 286 males and 135 females, or more than twice as many men as women. Finally, Dr. Loewenberg, a well-known specialist for ear-diseases, has reported a considerable increase of inflammatory affections consequent upon influenza, the most common form being the classical acute middle otitis. Considering the easy transmission of catarrhal affections from the nose to the Eustachian tube, and even the drum, no one will wonder at the spread of ear-diseases. None, however, proved fatal, and all, as a rule, were easily amenable to treatment. Yet the circumstance was worthy of mention. To complete the review, during the first week of January the total number of deaths rose to 2683 (1470 males and 1213 females), and in the second week decreased to 2065 (1121 males and 944 females), against 2374 during the last week of December. The mortality during the same period a year since was as follows: December, 1888, fifty-second week, 1033; January, 1889, first and second week, 970 and 1114. The increase, a large one, it must be admitted, was solely due to the influenza sequelæ already alluded to. The treatment recommended by Dr. Dujardin-Beaumetz and other physicians, and generally found beneficial, has been quinine, in doses of 8 to 16 grains a day; also exalgine and analgesine (antipyrin) in usual doses. Many patients, after taking antipyrin, suffered from a variety of eruptions and rashes, that may have resulted from either the disease or the medicine. Bronchial and pulmonary affections were treated as such, but quinine was almost invariably added to the ordinary therapeutic agents. An amusing sign of the times is that all the advertised medicines which were last summer sure to cure typhoid and bowel complaints now turn out to be, from peppermint to cathartics, infallible remedies for influenza.

While many new drugs are added to the materia medica, it is not desirable that the older and safer ones should be suffered to pass into oblivion. Drs. Combemale and Dubiquet, of Lille, have been recently taking up again elder-bark, *Sambucus nigra*, with a view to ascertain whether it really possesses the properties spoken of by former writers on therapeutics. The fresh bark was used exclusively, and the result of their investigations upon animals, carried on with the precautions usual to modern physiologists, has been that, although the whole bark is far from inert, the inner is more active than the outside bark, and a cold maceration of the fresh drug will operate differently from the decoction. With the outside bark, or smaller quantities of the inner, exhausted by decoction, only diuretic effects are obtained. A cold maceration of the inner bark, on the contrary, in the dose of 3 grammes (45 grs.) per kilogramme (2 lbs.) body weight, will, after thirty minutes, cause easy and painless vomitings and copious catharsis, without straining or griping. Their conclusion is that, owing to its gentle action and the absence of unpleasant after-effects, elder-bark is clearly indicated in infantile practice.

What becomes of alkaloids in seeds during their germination is an interesting question, which Professor Ed. Heckel, of Nancy, has partly elucidated in a memoir presented this month to the Academy of Sciences. The alkaloids, or active principles, experimented with were caffeine, eserine, strychnine, and daturine. For caffeine, kola-seeds were clearly preferable to coffee. The green bean was found to contain 2.37 per cent. of caffeine. After one year the cotyledons, much enlarged, had only 1.072 per cent.; .70 after two years; and .21 after three years. Chloro-

phyll and potassium nitrate, never present in the unsprouted bean, now replaced caffeine. As regards nux vomica and stramonium seeds, the decomposition was more speedy, from two to six months being sufficient for all alkaloids to have disappeared. The same remark applies to calabar-bean. M. Heckel's conclusion is that, most likely, alkaloids and active principles are for plants a store of reserve food. On the other hand, they do not act as ordinary nitrogeneous manure, for, some fifteen years since, O. Reveil showed that when plants are watered with solutions of their own alkaloids, far from striving, they are soon killed and disappear.

Dr. Cordier, of the Lyons Antiquaille Hospital, has observed several instances of the incompatibility between local applications of calomel and iodides administered inwardly. The following typical case deserves to be related. A patient suffering from tertiary chancres on the prepuce came to consult him, and was prescribed iodide of potassium solution in 4 or 5 grammes (45 or 60 grs.) daily doses. The next day the man returned in a sore plight, his penis being much tumefied, very painful, and affected with phimosis and a purulent discharge. With a hydrocele syringe a subpreputial injection was administered, whereupon a greenish-yellow powder was noted to come out, mixed in with the pus. At once the idea struck Dr. Cordier that calomel had been used locally, and such proved to be the case, the former medical attendant having mistaken the lesions for primary chancres. Under the influence of the soluble iodides voided in the urine the calomel had turned to mercurous iodo-chloride, a compound possessing marked caustic properties. Simple cooling and emollient lotions soon allayed the soreness and irritation. A similar, but less severe, case greatly puzzled a brother physician, who came to consult Dr. Cordier in regard to a patient, 60 years of age, affected in a like manner. Copious washings with a borated lotion proved efficient in this instance. From a number of such cases it was found that as little as 8 grains of potassium iodide is sufficient to bring on the formation of iodo-chloride, and cause the patient much inconvenience. But, of course, a certain conformation of the prepuce is necessary.

According to Dr. Hayem, the steady presence of urobilin in urine is an unfailing sign of a liver affection. It is customary to examine the water for albumen, urea, uric acid, etc., all of which have a meaning in kidney disorders. But with a new patient it is quite as important to look for urobilin, as it will indicate liver-troubles long before any other symptom will. Hence its value in a class of complaints too often unsuspected until it is nearly too late for a successful treatment. It should be borne in mind that it is not the quantity of urobilin, but its constant and prolonged presence, which has pathological importance, and indicates either commencing alcoholic cirrhosis or hepatic lesions from other causes. Another caution is that, as pure urobilin only possesses a weak coloring power, it may be found in notable proportions in light-colored urines. [A process for detecting urobilin was given in the THERAPEUTIC GAZETTE of January, 1889, page 56.]

A museum of legal medicine is among the projects now contemplated. Dr. Brouardel and Judge Guillot, of the Paris Medico-Legal Society, who are the promoters, recalled at a recent meeting that Lyons, thanks to Dr. Lacassagne's efforts, has been for several years provided with a collection of the sort, which is found exceedingly useful in difficult cases. The city of Vienna, Dr. Horteloup remarked, has also a very good medico-legal museum, containing, among other specimens, a unique collection of hymen membranes, serving as points of comparison in cases of rape. A committee has been appointed to consider the question, and bring the project to a practical issue.

PARIS, January 22, 1890.

Notes and Queries.

INCOMPATIBILITY IN PRESCRIPTIONS.

At the meeting of the Pharmaceutical Society, held December 17, 1889, MR. JOS. W. ENGLAND, of Philadelphia, read a paper on "Incompatibility in Prescriptions," of which the following is an abstract of the more important points of practical value to the physician (*American Journal of Pharmacy*). In the first place, it is highly desirable to have information as to the solubilities of different salts. The following statements apply to the agents most frequently used:

Acetates are soluble.

Arseniates are insoluble, except those of the alkali metals.

Arsenites are insoluble, except those of the alkali metals.

Bromides are soluble, except mercurous and silver; those of antimony and bismuth are decomposed by water to form oxysalts.

Carbonates are insoluble, except those of the alkali metals.

Chlorides are soluble, except those of lead (*s*), mercurous, and silver.

Citrates are soluble, except those of manganese, mercurous, silver, and strontium, aluminum (*s*), barium (*s*), bismuth (*s*), cadmium (*s*), calcium (*s*), lead (*s*), zinc (*s*).

Cyanides are insoluble, except the mercuric, and those of the alkaline metals and earths.

Hydrates are insoluble, except those of barium, strontium, calcium (*s*), lead (*s*), and the alkali metals.

Iodides are soluble, except those of antimony, bismuth, gold, lead (*s*), mercuric, mercurous, platinum (*s*), and silver.

Nitrates are soluble.

Oxalates are insoluble, except those of antimony (*s*), chromium, ferric (*s*), ferrous (*s*), stannic, and the alkali metals.

Oxides are insoluble, except those of barium, strontium, calcium (*s*), and the alkaline metals.

Phosphates (ortho) are insoluble, except those of the alkali metals.

Sulphates are soluble, except those of barium, strontium, calcium (*s*), antimony, lead, mercurous (*s*), and silver (*s*).

Sulphides are insoluble, except those of barium, calcium (*s*), strontium, and the alkali metals.

Sulphites are soluble, except those of aluminum, antimony, barium, calcium (*s*), cobalt (*s*), copper, ferrous (*s*), lead, manganese (*s*), nickel (*s*), silver, stannous, strontium, and zinc (*s*).

Tartrates are soluble, except those of antimony, barium, bismuth, cadmium (*s*), calcium (*s*), copper, ferrous (*s*), lead, manganese (*s*), mercuric, mercurous, nickel (*s*), silver, strontium (*s*), and zinc (*s*).

Acids decompose hydrates, carbonates, and acid carbonates to form salts; the stronger acids, which are largely inorganic, set free the weaker acids, which are largely organic, or, brought in contact with alcohol or alcoholic solutions, form ethers; alkaline hydrates, carbonates, and acid carbonates neutralize free acids, decompose some glucosides, and precipitate all alkaloids, some of which precipitates are soluble in excess of the precipitant, or in alcohol, if that liquid be present in sufficient amount to dissolve them.

Oxidizing agents, such as nitric, hydrochloric, nitrohydrochloric, picric, and chromic acids, and potassium bichromate and permanganate, with readily oxidizable substances, such as carbohydrates, alcohols, ethers, sulphur, phosphorus, sulphides, and organic matter in general, form explosive compounds. Potassium permanganate, if ordered in pill form, can best be made with cacao-butter, and cosmoline in very small quantity, and enclosed in gelatin capsule. Silver nitrate is reduced by organic matter to oxide, with the exception, it is said, of opium and extract of hyoscyamus. A very good way of making pills of it is with cacao-butter and cosmoline, etc., as mentioned above, under potassium permanganate; syrup of ferrous iodide and potassium chlorate form a poisonous compound; and potassium iodide and potassium chlorate form a mixture which yields the poisonous iodate on being taken internally.

Iodine and the iodides yield precipitates with the alkaloids; bromides precipitate morphine and strychnine salts on standing, but a few drops of dilute hydrochloric acid added, after the addition of the alkaloid, prevents the change. Sodium biborate precipitates morphine and cocaine salts; but, on the addition of a small quantity of boric acid, or with boric acid alone, precipitation does not take place. Mercuric chloride, with acidulated solutions of the alkaloids, forms crystalline double salts; potassium-mercuric iodide precipitates alkaloidal solutions. Solutions of quinine salts, with those of the alkaline acetates, or with Basham's mixture, precipitate the sparingly soluble quinine acetate. Morphine solutions give the phenol reaction, if mixed with tincture of ferric chloride.

Glucosides are decomposed by free acids and precipitated by tannin; tannic and gallic acids precipitate alkaloids, albumen, gelatin, and the majority of metallic salts, and yield inks with iron solutions.

Resinous tinctures and fluid extracts, prescribed with aqueous solutions, should always be emulsified with acacia; tinctures and fluid extracts made of stronger alcohol, mixed with those made of diluted alcohol, become turbid and precipitate, since the special solvent power of alcohol, or of water, for a substance diminishes in proportion to the quantity of the other liquid present. A "shake" label should always be used.

When for internal use, fixed and volatile oils and oleo-resins, and aqueous solutions, should always be emulsified, whether ordered or not, and, to better emulsify the volatile oils, they should have mixed with them, prior to emulsification, an equal volume of olive, almond, or cotton-seed oil.

Tincture of ferric chloride gelatinizes mucilage of acacia; free acids separate insoluble carminic acids from compound tincture of cardamom; free acids precipitate glycyrrhizin from fluid extract of licorice.

Commercial spirits of nitrous ether liberates iodine from solutions of iodides, decomposes antipyrin solutions to form a green nitro-derivative, and precipitates mucilage of acacia; but, if it be well diluted with water, it can usually be added last without precipitating. Tincture of guaiac and spirits of nitrous ether are stated to be pharmaceutically incompatible by Potter (although they are often prescribed together), likewise infusion of wild cherry with compound infusion of gentian, infusion of cinchona with compound infusion of gentian, and infusion with metallic salts generally.

Sodium salicylate in solution precipitates the sparingly soluble salicylic acid if mixed with acids, and yields, if dispensed in powders with potassium acetate, the very deliquescent potassium salicylate. Sodium salicylate in strong solution is decomposed by tincture of ferric chloride; but, if well diluted first, changes only into ferric salicylate. Sodium benzoate solution is decomposed by acids to yield the sparingly soluble benzoic acid.

Mercuric chloride is decomposed by solution of potassium arsenite; but, if the alkaline solution has first added to it, in slight excess, diluted hydrochloric acid, no precipitation will take place on the addition of the mercurial salt; pyrophosphate and phosphate of iron solutions precipitate with dilute phosphoric acid. The *National Formulary* recommends the usage of dilute metaphosphoric acid, in place of the officinal "ortho" variety, as yielding a permanently clear solution.

THE TREATMENT OF INFLUENZA.

M. H. HUCHARD, writing in the *Revue Générale de Clinique et de Thérapeutique* (December 12), speaks of nervous prostration as being a chief clinical characteristic of severe cases of influenza, requiring for its treatment quinine, alcohol, and, in bad cases, even injections of caffeine and ether. Quinine, he says, is indicated on account of the markedly remittent type of fever, and to moderate the evening exacerbation it suffices to give a full dose (5 to 15 grains) of the sulphate of hydrobromate in the morning. Smaller doses more frequently taken are useful for their tonic rather than antipyretic effect. In the neuralgic or rheumatoid form of influenza, antipyrin (15 grains), combined with bicarbonate of sodium (7½ grains), is recommended by M. Huchard, to be taken every four hours, or, instead of antipyrin, phenacetin, or salol (7 grains). Influenza often assumes a bronchopulmonary form, and in certain cases is very grave. In the epidemic of "la grippe" in 1886, recorded by M. Menetrier, the pneumonic forms were very asthenic. In such cases, tonics, milk, alcohol, and, in fact, general restorative measures are indicated rather than local applications to the chest. If the dyspnœa became severe, and the condition termed by Graves "pulmonary paralysis" ensues, then strychnine is of value; or, in case of impending asphyxia or renal asthma, venesection; but when the asthenia itself threatens life, there should be no hesitation at resorting to hypodermic injections of ether, and especially of caffeine. For the gastro-intestinal form, mild aperients, ipecacuanha, and the use of salicylates of bismuth or of magnesium, naphthol, or iodoform to promote intestinal antisepsis, are indicated.—*Lancet*, December 21, 1889.

THE ADMINISTRATION OF CHLORAL.

WIDERHOFER recommends the following in the treatment of convulsions in children:

> Chloral, gr. viiss to xl;
> Water, ʒii;
> Syrup of bitter orange-peel, ʒv.
> Teaspoonful to be taken every two hours.

The following has been recommended by Yvon for administration to adults:

> Chloral, gr. xxx to xlv;
> Bromide of sodium, gr. xxx to xlv;
> Syrup of codeine,
> Syrup of bitter almonds, aa ʒss;
> Water, ʒii.

The following is likewise recommended by Yvon in cases of asthma and dyspnœa:

> Chloral, gr. xxx to lx;
> Iodide of sodium, gr. xxv;
> Simple syrup, ʒv.
> Tablespoonful to be given every hour.

As an enema in infantile convulsions the following has been proposed:

> Musk, gr. iii;
> Chloral, gr. viiss to xv;
> Camphor, gr. xv;
> The yolk of one egg;
> Water, ʒii.

As a suppository chloral may be used in

the following combination, in which the caustic and irritating action of chloral is largely overcome:

Chloral, gr. viiss;
Extract of belladonna, gr. ½;
Cocoa-butter, gr. xlv.

—*Revue Gènèrale de Clinique et de Thèrapeutique*, December 19, 1889.

THE EFFECT OF DISTENTION OF THE ABDOMEN ON CIRCULATION AND RESPIRATION.

The effects of pregnancy, ovarian dropsy, ascites, and other diseases leading to great distention of the abdomen, in impeding respiration and disturbing the action of the heart, though there is little unanimity or precision in the opinions that are entertained respecting them, are generally admitted. Such affections are, indeed, of a chronic nature; the abdominal walls have time to yield, and the organs both in the abdomen and in the chest are enabled to accommodate themselves to the altered conditions; but we are not aware that any experiments have been undertaken to determine the effects of sudden distention of the abdomen in animals until the appearance of a paper by Dr. G. Heinricius, of Helsingfors, in a recently published number of the *Zeitschrift für Biologie*. It is generally believed that in pregnancy there is a marked increase in the tension of the systemic vessels, and that as a consequence the heart undergoes hypertrophy; but although such statements are to be found in almost every gynæcological textbook, the evidence on which they rest is extremely slender. In order to determine whether any obstruction to the circulation which may exist in the uterine vessels in pregnancy would raise the general blood-pressure, Dr. Heinricius first performed the very simple experiment of tying the aorta just above its division into the iliacs, and found that in four rabbits no change took place in the arterial tension of the carotids. Hence no effect was to be expected from ligature of the uterine arteries, nor from any such obstruction as might proceed from their distribution in the pregnant uterus and in the placenta. He next proceeded to ascertain by experiment the effects of distention of the abdominal cavity in the rabbit and cat. He employed a double canula, which was introduced through or at the side of the linea alba by a small puncture in narcotized animals; one arm of the canula was connected with a vessel containing normal saline solution at the temperature of the blood, and the other with a manometer. Arrangements were further made to record graphically the respiration and the blood-pressure in the carotid. The respiratory and blood pressure curves were taken after each 50 or 100 cubic centimetres of the solution had been injected into the abdomen from the vessel, and the phenomena which were presented proved to be remarkably uniform. In all the experiments, which numbered fifteen, it was found that the abdominal cavity could be filled with a large quantity of fluid, so that the parietes were quite tight, without either pulse or respiration being materially disturbed. It was only after very great distention had been produced that the respirations became more frequent and deeper, the expiratory effort being particularly well marked. This dyspnœa was apparently attributable to the diaphragm being pressed upward and the capacity of the thorax correspondingly diminished, so that mechanical obstruction to respiration was occasioned. The effect of this was that the accessory respiratory muscles were brought more into play, and the breathing became more and more thoracic in character. But these efforts soon became insufficient to compensate for the defective action of the diaphragm. The respiratory centre became excited, but was soon paralyzed by the venous blood. The respirations underwent a change: they became first shallow and slow, then deeper, dyspnœa finally occurred, and the animal died. If we turn now to the effects of the distention on the circulation, we find that when the distention became considerable the pulse at first increased in frequency, then became fuller, afterwards less frequent, and before the death of the animal usually suddenly smaller. The arterial blood-pressure first began to rise when the frequency of the pulse had considerably diminished, and then gradually fell as the pulse became smaller. Dr. Heinricius gives in the article we have alluded to numerous tracings, which collectively show that the abdomen may undergo great distention without abrogation of the more important vital functions. The abdominal cavity of a rabbit can support in this way the introduction of 500 cubic centimetres of fluid without difficulty, and nearly a litre and a half of fluid can be further injected before dangerous symptoms supervene, clearly showing how extraordinarily yielding the abdominal parietes are, and

affording a proof that it is not necessary to appeal to the slowness with which they are distended in pregnancy and in cases of abdominal tumor to explain the slight interference with the main functions of life that occurs in those conditions.—*Lancet*, November 9, 1889.

ESSENCE OF WINTER-GREEN.

At the meeting of the Société Nationale de Médecine de Lyon, held on December 23, 1889 (*Lyon Médicale*, December 28, 1889), MESSRS. CADEAC and ALBIN MEUNIER presented a communication, in which they stated that the essence obtained by the distillation of the flowers of the *Gaultheria procumbens*, or by the distillation of the bark of *Betula benta*, is composed of about nine-tenths of the salicylate of methyl and of the hydrocarbons isomeric with the essence of turpentine. The authors state that the essence of winter-green is a convulsivant of great energy, and its properties possess a degree of toxicity equal to those of the salicylate of methyl. Experimental studies prove that the essence of winter-green and the salicylate of methyl possess precisely the same properties and degrees of toxicity. Although the salicylate of methyl obtained by chemical synthesis is a little the more powerful stimulant, on the other hand its depressing effect is less marked than that of the pure essence.

AMMONIA IN COCAINE-POISONING.

A case of poisoning by a very moderate quantity of cocaine is reported by DR. GOLOVKOFF, in the Proceedings of the Caucasian Medical Society, where ammonia was used with good effect to restore the patient. The patient was a somewhat delicate woman, who was suffering severely from toothache. The pain becoming unbearable, Dr. Golovkoff injected 15 minims of a two per cent. solution of the hydrochlorate of cocaine under the skin of the left cheek, which gave relief for three or four hours, when the pain returned as acutely as ever. A second 15 minims were injected, and in about five minutes' time the patient became restless, her pupils dilated, the surface of the skin became pale; the pulse and likewise the respiration became rapid, and shivering came on; the respiration soon ran up to 200 per minute, and was labored. A curious effect, too, was produced on the sounds of the heart, causing them to be audible at the distance of two paces from the patient. There was great pain over the cardiac region and back, together with a dread of death and convulsive movements of the limbs. There was some liquor ammoniæ at hand, and this the patient was given to smell, and a few drops were given internally every five or ten minutes. Amyl nitrite was also employed, but the latter seemed to do more harm than good, while the ammonia soon brought the pulse and respiration, and indeed the general condition of the patient, into something more like their natural condition, so that in about a couple of hours she had quite recovered. Dr. Golovkoff remarks that the only case he has been able to find in medical literature where ammonia was used as an antidote in cocaine-poisoning was one by Dr. Gooding, of Barbadoes, reported in the *Lancet* of 1888, vol. i. p. 394, and copied into the *Meditzinskoĭ Obozrênie*. (This was a case of a negress who had developed alarming symptoms after less than half a grain had been injected into the gum; she was treated by hypodermic injections of ether and ammonia.)—*Lancet*, November 30, 1889.

A NEW CONTRIBUTION TO THE STUDY OF PNEUMONIA.

It was in 1882 that Friedlander announced the discovery in the exudates of pneumonia of a peculiar micro-organism, which he thought to be the cause of the disease, and which has since then been called Friedlander's microbe. Other investigators, as Leyden and Gunther, confirmed the discovery. The experimental demonstration of the causal relation of this microbe to acute pneumonia was made by Friedlander, of Berlin, and by Talamon, of Paris.

It will be remembered that Friedlander injected directly through the walls of the chest, by means of a Pravaz syringe, a certain quantity of microbes held in suspension in distilled water; hares, guinea-pigs, dogs, and mice were the subjects of the experiments. The hares remained refractory. All the mice succumbed in from eighteen to twenty-eight hours after the injection, and the autopsy revealed intense pulmonary congestion, with nodules of red hepatization. Out of eleven guinea-pigs, six died with pneumonic lesions. Of five dogs, only one succumbed with similar lesions. In another series of experiments, mice were made to inhale a spray containing the coccus in suspension; many succumbed with the lesions of typical pneumonia.

Talamon, about the same time, confirmed Friedlander's results by a series of similar experiments on hares and guinea-pigs. The lungs of hares presented by him to the Anatomical Society constituted typical specimens of true lobar fibrinous pneumonia. Affanassieu repeated these experiments in Professor Cornil's laboratory, with like results.

Recently Platania, an Italian experimenter, has undertaken similar researches with Friedlander's pneumococcus (*Bulletin de Thérapeutique*, December 15, 1889). He has produced pneumonia by inoculating the microbe by the natural passages, at the same time favoring the result by aseptic traumatism of the lung through the thoracic parietes, or by causing the animal to inhale irritant gases, as ammonia, hydrochloric acid, etc. He has found, as a condition of successful experimentation, that some degree of traumatism at the point of inoculation, whereby the vital resistance of the lung is weakened, is necessary; it was not enough that the pneumococcus should be simply inhaled, and all such experiments failed to induce pneumonia.

Platania has endeavored to ascertain whether chilling of the pulmonary texture, formerly regarded as the direct cause of pneumonia, was also a predisposing condition of the production of the disease in animals inoculated with or made to inhale the specific microbe. Animals after inoculation were placed in a frigorific apparatus for a brief time; these invariably succumbed more readily to the disease with a more elevated temperature and more extensive pneumonic lesions than animals similarly inoculated that had not been exposed to the cold. Out of eleven guinea-pigs inoculated by the trachea and exposed for half an hour to intense cold, in eight the result was positive and in three negative. "If," he says, "we compare this experiment with that of simple tracheal inoculation, where in ten cases nine were negative, we are obliged to conclude that the influence of chilling does really manifest itself in our experimentation as a condition which predisposes the organism to cultivate in the lung the pneumococcus of Friedlander."

Platania also varied the experiment, both in subjecting the animals to refrigeration and in making use, as the material of infection, of dust containing the specific disease-germs, which the animals were made to inhale with cold air. Out of eight cases, three were positive and five negative.

As the complement of these researches, he studied the action of chilling alone. He placed a certain number of animals for a time in an elevated temperature (104° F.), then chilled them in various manners,—by plunging them directly in ice-cold water, by enclosing them in boxes surrounded by a frigorific mixture, etc. The results were conformable to those already obtained by other experimenters,—that is, there was found a state of hyperæmia of divers organs, but never the least focus of inflammation, or anything like pneumonia, in any of the animals subjected to experiments of this kind.

Doubtless the majority of pathologists now incline to the view that the microbic origin of frank fibrinous pneumonia is rendered more than probable by researches such as those above described. It is not yet definitely settled whether the encapsulated micrococcus of ordinary saliva, called by Sternberg *micrococcus Pasteuri*, be really identical with Friedlander's pneumonia-coccus. It will be remembered that Sternberg induced pneumonia in rabbits by injecting this microbe; and still more recently, Chautemesse has shown by numerous experiments that the injection of two or three cubic centimetres of normal saliva into the lung determines in twenty-four hours the death of the animal, after having produced an intense fever and a red hepatization, with, at the same time, a fibrinous pleurisy and pericarditis in which the encapsuled micrococci exist in great numbers.—*Boston Medical and Surgical Journal*, January 23, 1890.

NAPHTHALIN AND CATARACT.

Dr. Kolinski, writing in Von Graefe's *Archiv*, Band xxxv. 2, points out that naphthalin, which is coming a good deal into use from the powerful effect it seems to have on the micro-organisms existing in the intestines in some cases of diarrhœa, possesses also the property of producing changes in the nutritive power of the blood, thus being liable to set up degeneration of the blood-vessels. As the eye is one of the most highly vascular organs, it is one of the first to show any of the changes induced by interference with the nutritive property of the blood. Naphthalin is said, first, to cause small extravasations in the choroid and in the ciliary body, then ecchymoses and white patches in the retina, and finally cloudiness in the lens and crystals in the vitreous.—*Lancet*, November 16, 1889.

FLOODS AND THEIR RESULTS FROM A SANITARY STAND-POINT.

We have received information from DR. GEO. J. GARRISON, the secretary of the Tri-State Sanitary Association, that arrangements have been completed to hold a Tri-State Sanitary Convention at Wheeling, W. Va., February 27 and 28, 1890. Representatives will be present with papers and addresses from Pennsylvania, West Virginia, and Ohio. The object of the convention is to consider the question of floods and their results from a sanitary stand-point, and the best methods of managing the sanitary interests of a given community after such a calamity.

Owing to the mutual relations held by these three States with reference to large rivers, and the numerous towns in each one of these States that are annually affected by floods and their results, it has been thought wise to hold a convention for studying how best to manage the sanitary interests of cities and towns so affected.

Every person interested directly or indirectly in this important subject is earnestly requested to be present and assist in discussing the papers, and add whatever information he can to the solution of these practical and most important questions, affecting as they do the health and lives of thousands of citizens of these three great Commonwealths annually.

Reduced rates of transportation have been secured over all lines controlled by the Central Traffic Association in the three States named on the certificate plan.

Application has been made to the Trunk Line Association for like favor.

STANDARDS FOR MILK ANALYSIS.

At the annual meeting of the Society of Public Analysts, MR. ADAMS, F.R.C.S. and F.C.S., public analyst for the county of Kent, the president of the society, gave his address. Mr. Adams dwelt on the importance of establishing standards for milk analysis. Formerly this was impracticable, as there was universal ignorance about the constitution of milks of various qualities, but of late years there had been a vast accumulation of knowledge on the subject of milk analysis, and it was quite possible to establish a standard for professedly pure milk. At the present time official referees and public analysts experienced great difficulty in certifying whether a milk was adulterated or not, owing to the want of a standard which all authorities could recognize as the lowest limit to which unadulterated milk might fall. The fact that great natural variations obtained in the quality of milk was the strongest argument in favor of fixing a standard. Mr. Adams has himself contributed very materially to the perfection of milk analysis, and we hope that the opinions he has expressed in his presidential address will attract the attention that they deserve. At the present time we suspect that a great deal of the milk sold is largely adulterated with water, and the fact that it can be sold with impunity is mainly due to the want of a common standard for public analysts and official referees.—*British Medical Journal*, January 11, 1890.

THE TENTH INTERNATIONAL MEDICAL CONGRESS.

We have received the following official notice concerning the Tenth International Medical Congress, which is to be held in Berlin in August, 1890:

"We, the undersigned, do hereby give notice that, according to the resolution passed at the Washington meeting, September 9, 1887, the Tenth International Medical Congress will be held in Berlin.

"The Congress will be opened on the 4th and closed on the 9th day of August, 1890.

"Detailed information as to the order of proceedings will be issued after the meeting of the delegates of the German Medical Faculties and Medical Societies at Heidelberg on the 17th of September in the current year.

"Meanwhile, we should feel sincerely obliged if you would kindly make this communication known among your medical circles, and add in the same time our cordial invitation to the Congress.

"VON BERGMANN,
"VIRCHOW,
"WALDEYER."

A NEW OPERATION FOR DISPLACEMENT OF THE UTERUS.

At the meeting of the Section in Obstetrics and Gynæcology of the New York Academy of Medicine, held December 26, 1889, DR. A.

P. DUDLEY narrated the history of a case in which he had operated for the permanent cure of displacement of the uterus (*New York Medical Journal*, January 25, 1890). The diagnosis had been that of marked retroflexion with fixation to one side. No mention of a dangerous operation had been made to the patient. It had been the speaker's opinion all along that fastening the uterus to the abdominal wall in any way was the changing of one pathological condition for another. He did not believe it would remain fastened long. He had reopened the abdomen in two cases after the removal of the ovaries and tubes, and had found the uterus free in the abdomen. He had examined the broad ligaments carefully in these cases, and in one had found the ligature smooth and encapsulated. He had been working to get at some method by which he could fix a retroverted, or retroflexed, flabby uterus without fastening it to the abdominal wall, as he regarded that procedure opposed to anatomical principles.

The speaker then described the steps of his operation by means of a diagram. It consisted in freshening a portion of the anterior surface of the uterus to within about three-quarters of an inch of the bladder junction; then, after dissecting out the round ligaments and removing a portion of the peritoneum from each one, he sutured these to the freshened portions on the anterior surface of the uterus by means of over-and-over catgut sutures about one-quarter of an inch apart. Care was taken to leave no raw surfaces. The uterus was thus maintained in its normal position, and there was no interference with the bladder. It had been suggested that he should put a pessary in the vagina to overcome the traction, but this he had refrained from doing, wishing the operation to rest upon its merits. A mural abscess developed, and the patient had some fever for a few days. No peritonitis supervened, and the immediate results of the operation had given no trouble. The uterus had so far maintained its position. He thought the advantages appeared manifold. The uterus was straightened, the round ligaments were shortened, and there was no liability to the formation of adhesions or of pockets which might involve the intestines. The freshened surfaces gave perfect union between the round ligaments and the uterus. The faults in other well-known methods were, he thought, that the sutures would cut through from any slight strain, and the limited number of punctures did not afford a sufficient amount of exudate, such as resulted from a freshened surface. He hoped to be able to produce his patient before the Society. He had found some cysts of the ovary which were tapped, and she had since been free from pain in that direction, and had experienced no bladder irritation.

DR. E. H. GRANDIN said that he considered Dr. Dudley's operation, so far as he could follow it, a clever one. He feared, however, that it would not ultimately fulfil its aim any better than others which had been devised. When subjected to the various influences of change common to the uterus, the adhesions would stretch. He had seen cases in which the uterus had gone back to its former malposition. He had known this to occur in Alexander's operation. The round ligaments stretched, and he believed this would happen in Dr. Dudley's case. He personally favored the operation of hysterorrhaphy, and the passing of sutures through the peritoneum, and not entirely through the abdominal wall.

The CHAIRMAN thought it was possible that some retroflexion might occur above the point at which the round ligaments were attached to the surface of the uterus; that the upper two-thirds of the body of the uterus might become retroflexed and cause trouble, the line of attachment being changed by the operation from its original position.

DR. DUDLEY replied that the portion of the uterus above the bladder junction was usually not more than three inches, and an inch and a third of round ligament was firmly stitched to this surface. When the uterus became enlarged from any cause, he thought it was more likely to give way after Alexander's operation than in any operation where the round ligaments were shortened. He thought his method offered advantages over any form of operation which fastened the uterus to the abdominal wall, where the adhesions were liable to give way from muscular action, the weight of the intestines, or during efforts in labor.

THE OPHTHALMIC REVIEW.

The *Ophthalmic Review* begins its new volume with an American editor, DR. EDWARD JACKSON, of Philadelphia, who succeeds Dr. James Anderson, of London. It will hereafter contain original articles from American as well as English ophthalmic surgeons, with notices of all ophthalmological papers published here or abroad, and full reviews of the more important of them.